THE IRON TRADE REVIEW

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QUICK DELIVERY

URGED ON MANY RECENTLY PLACED ORDERS.

Increased Buying of Rails — Larger Output of Blast Furnaces— Scarcity of Crude Steel— Pig Iron Rather Dull.

Just one year ago the price maintenance policy, which had been adhered to since the panic of October, 1907, was abandoned and price reductions of from $2 to $4 per ton on nearly all finished products were announced. The expectation that business would soon revive was not realized, and not until prices had declined from $8 to $10, compared with June 1, 1908, following the declaration of the open market last February, did buying really become active. In the past three months the recovery has been rapid, and the prospects are most encouraging. The week has added new evidences of the return of genuine prosperity. One of the most significant features at present is the insistence of many buyers—especially the railroads—on prompt delivery. One of the large independent interests reports that it now has more orders on its books than ever before in its history. May bookings of merchant pipe by the leading interest and many of the independents made a new high record. One of the important developments is the placing of orders for new ocean vessels, which will require about 40,000 tons of plates, and other vessels for ocean and lake service are being figured on.

Structural Material

Although some very low prices are still being made on fabricating, prices of structural shapes are firm at 1.30c Pittsburg, and several interests are asking 1.35c. Among the orders placed are a hotel at Forty-second and Broadway, and a loft building, New York City, to the Eastern Steel Co., the first order for the hotel being for only 1,000 tons, but the building to be ultimately 30 stories; the Chamberlin building, Chicago, 1,200 tons, to George W. Jackson, Chicago; Corrigan, McKinney & Co., Cleveland, 1,500 tons of structural material to the Van Dorn Iron Works for their new blast furnace and buildings, and the T. H. Brooks Co., Cleveland, has taken contracts for the Brown building, Cleveland, 1,300 tons, and the Anisfield building, 500 tons, also in Cleveland. Five stories of the Brown building will be erected at once and ten more are to be added later.

Railroad Buying

Increased buying of steel rails has been a prominent feature of the market. The Harriman lines awarded 150,000 tons to be delivered at the rate of 18,000 tons per month. The allotment among the companies which will do the rolling has not yet been announced. Other rail orders were: The Chicago & Alton, 9,000 tons to the Illinois Steel Co.; the Missouri Pacific, 35,000 tons, divided between the Illinois Steel and the Carnegie Steel Co. The Carnegie Steel Co. has also received orders for 10,000 tons from the Chicago & Northwestern; 5,000 tons from the Northern Pacific; 14,000 tons from the Lake Erie & Pittsburg; 4,000 tons from the Erie, and 10,000 tons from the Soo Line. The rail mill at South Chicago entered June with a larger tonnage of orders than it has had since the panic of 1907, and within the past week has added nearly 100,000 tons more to its orders. The same company has all the plate business it can fill up to August, while its shipping instructions on steel bars exceed its output for fully two months. Railroad orders for structural work include 3,000 for the St. Paul, and 2,000 tons for the M., K. & T. railway, and 500 tons for the Mono. The B. & O. is figuring on 3,500 cars, and the Harriman lines on 4,000 cars; the Pennsylvania lines east have ordered 113 steel cars.

Pig Iron Conditions

Pig iron production in May amounted to 1,856,757 tons, and the average daily production surpassed that of any month since October, 1907. The increase for May over April was 133,104 tons. Sales of pig iron do not include any very important transactions, but there is a very fair volume of small orders and prices are firm. An inquiry for 34,000 tons of gray forge comes from eastern Pennsylvania. The demand for southern spot iron is not active, and low prices are still named in some cases.

Crude Steel

Owing to the rapid increase of orders for finished material, several independent interests are having difficulty in obtaining supplies of crude steel, and there is some exchange of billets among companies. Low prices for rivets have increased the demand for rivet rods. Prices on all crude steel are firmer.

Some Weak Spots

Large stocks of wire products have been depleted, and the demand continues strong. The leading sheet and tin plate interest has increased its production to almost normal rate, but there is some shading on sheets, especially in the Chicago district, where Ohio mills are competing for business. Some very low prices are still being made on rivets, spikes and shafting. Additional interests have advanced their prices on steel bars to 1.25c. Bar iron shows slight improvement.

THE WEEK IN IRON CENTERS

PITTSBURG.

Order Books Well Filled and Most Encouraging Prospects.

Office of THE IRON TRADE REVIEW,
510 Park Bldg., June 8.

Heavy tonnages in practically all lines of iron and steel continue to be offered to the mills, but the latter, with order books well filled and future operations reasonably assured, are inclined to look with conservatism upon the acceptance of much additional business at prevailing prices. Many companies have adopted the policy of raising asking quotations above the generally-understood level of the market in order to divert the tide of orders from themselves. Additional producers have joined the ranks of those steel bar makers who have recently been asking 1.25c Pittsburg, and important plate and shape interests have now elevated their quotations to 1.35c Pittsburg applicable to ordinary business.

High booking records made during the month of May are still being announced and are giving the market a strong tone. The principal pipe interests, including both the leading maker and the independents, experienced the best month of any May in their history in orders entered. Sheet and tin plate companies also equalled their fullest month. An immense tonnage in wire products was accumulated on makers' books and deliveries have now been considerably extended. Shortages of steel, particularly in openhearth, have been forcing some large mill interests into the open market.

An encouraging development is the increasing evidence of greater buying, actual or in contemplation, by the railroads. The western lines have been purchasing rails, track fastenings and other supplies fairly well and this movement appears to be working its way eastward. The past week with the Carnegie Steel Co., when 23,600 tons of standard sections were booked for prompt shipment, was the best for many months in this company's rail department. Steel car orders are being placed more freely and numerous inquiries are out, so that these manufacturing interests are considerably more optimistic over the prospects of greater plant activities soon. It is the general belief among steel makers and manufacturers that after the expiration of July 1 of the fiscal year for many of the railroads, a more earnest patronage will arise from this source.

Pig Iron.—The market has quieted down somewhat, as the general inquiry is not so much in evidence. At the same time, melters appear to be better satisfied with the prospects for future business and are desirous of entering into contracts for their forward requirements. As a result, there is less shopping about to be noticed. Ingot mold and roll makers and other lines of manufacture dependent upon steel making operations are getting a good trade now and are buying pig iron more freely. Iron prices are stationary.

There is considerable inquiry out for Bessemer, and two lots of 10,000 and 3,000 tons, respectively, for delivery to this district are under negotiation. The latter tonnage is for third quarter. Malleable is in good demand and the price of this grade runs from $14.65 to $14.75 valley. A sale of 500 tons for third quarter at $14.75 valley was made this week.

An ingot mold interest has taken about 1,000 tons of basic for June and July at $14.50 valley. Some important users of basic in this territory who have not covered for their third quarter needs are still in the market. Foundry iron is not especially active.

In southern iron, one of the large producers has raised its price to $12 Birmingham for No. 2 for third or fourth quarter delivery.

On prompt and third quarter shipment on northern iron, we quote as follows:

Bessemer, valley	$15.00 to 15.25
Bessemer, Pittsburg	15.90 to 16.15
No. 2 foundry, Pittsburg	15.65 to 15.90
Gray forge, Pittsburg	14.65 to 14.90
Basic, valley	14.50 to 14.75
Basic, Pittsburg	15.40 to 15.65

Ferro-Alloys.—The prompt market on 50 per cent ferro-silicon continues very strong, and some fancy prices have been paid in recent transactions. Based on the present duty, quotations for the future are not so high. There has been considerable buying of ferromanganese by local users recently, but the market has not hardened perceptibly. We quote 80 per cent ferromanganese at $41 to $42 seaboard with a freight rate of $1.95 to Pittsburg.

Fifty per cent ferro-silicon is quoted at $63 to $65 Pittsburg on forward deliveries; domestic, 12 per cent, $26; 11 per cent, $25; 10 per cent, $24, Pittsburg.

Plates.—Steel boat contracts have just been placed in the east which will require from 35,000 to 40,000 tons of plates and shapes. The American Hawaiian Steamship Co. has contracted for three boats from the Maryland Steel Co. for which from 18,000 to 20,000 tons will be needed. The Morgan Steamship Co., affiliated with the Southern Pacific railroad, has placed four steel steamships with the Newport News Ship Building Co. and the steel required, about 16,000 tons, will likely go to the Carnegie Steel Co. Car building activity is on the increase. The Baltimore & Ohio railroad is figuring on 3,500 steel cars and the Harriman lines on about 4,000 steel cars. The Pennsylvania lines east have placed 113 steel coaches, of which 27 will be built by the Pressed Steel Car Co., 30 by the Standard Steel Car Co. and 56 by the American Car & Foundry Co. The Gould lines are also reported to have just closed on a large assortment of cars. The plate mills are running very close to capacity and order books are well filled. The principal makers including the Carnegie Steel Co. and the Jones & Laughlin Steel Co. are asking 1.35c except on very attractive business. We quote the present market at follows:

Tank plates, ¼-inch thick, 6¼ to 100 inches, 1.25c to 1.35c mill. Extras are as follows per 100 pounds: Boiler and flange steel plate, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½-inch to and including 3/16-inch plate on thin edges, 0.10c; under 3/16 to and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

Sheets.—The American Sheet & Tin Plate Co. this week has its Vandergrift and Leechburg plants on in full, and has started its Piqua works, giving it an active capacity of 140 mills or 70 per cent compared with 117 mills or 63 per cent last week. The company has been receiving very heavy orders for its products and in May made shipments fully up to a normal capacity. The orders booked by it

last week were the heaviest for any similar period in many months. The independents are also doing very well and about 75 per cent of this capacity of the country is in operation. Considerable shading in sheet prices continues, but this is usually applied to galvanized grades, as black sheets are comparatively firm. We quote present minimum prices which are subject to some shading, as follows:

Blue annealed sheets, Nos. 10 and heavier, 1.60c; Nos. 11 and 12, 1.65c; Nos. 13 and 14, 1.70c; Nos. 15 and 16, 1.80c; box annealed sheets, Nos. 10 to 12, 1.85c; Nos. 13 and 14, 1.90c; Nos. 15 and 16, 1.95c; Nos. 17 to 21, 2c; Nos. 22 to 24, 2.05c; Nos. 25 and 26, 2.10c; No. 27, 2.15c; No. 28, 2.20c; No. 29, 2.25c; No. 30, 2.35c; galvanized sheets, Nos. 13 and 14, 2.30c; Nos. 15 and 16, 2.40c; Nos. 17 to 21, 2.50c; Nos. 22 to 24, 2.65c; Nos. 25 and 26, 2.85c; No. 27, 3.05c; No. 28, 3.25c; No. 29, 3.40c; No. 30, 3.60c; painted roofing sheets, $1.55 per square for No. 28 gage, 2½-inch corrugation, and galvanized roofing sheets, $2.80 per square for No. 28 gage, 2½-inch corrugation.

Tin Plate.—The past week has brought out a heavy volume of tin plate specifications for delivery in the immediate future, and it is very probable that the recent action of the American Sheet & Tin Plate Co. in declaring for an open shop in its plants has caused consumers to anticipate their needs against the possibility of any labor disturbances. The open shop policy of the company becomes effective July 1. Recent shipments in tin plate have reached very large figures, in some cases being practically normal. Operations with both the leading interest and the independents recently have shown little change. Tin plate prices are regular and we quote the present market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.45 f. o. b. mill Pittsburg district and $3.40 in large lots. Terms 30 days less 2 per cent for cash in 10 days.

Rails and Track Material.—The Missouri Pacific railroad has closed for 35,000 tons of standard rails for prompt shipment, of which 16,000 tons will be furnished by the Carnegie Steel Co. and 19,000 tons by the Illinois Steel Co. The standard rail bookings of the Carnegie Steel Co. last week were 23,600 tons, which was the best week for this company in this respect in many months. Orders were taken from two small lines for 2,200 and 1,000 tons respectively, and frog and switch companies specified liberally. Light rail orders were 1,600 tons. The rail situation is showing marked improvement in prospects and it is expected that the active buying in which the western roads have participated will soon be taken up by the eastern systems to the benefit of the rail makers in this section. The light rail mill at the Edgar Thomson plant has a good schedule ahead of it in accumulated orders. In spikes, western roads have been the principal buyers and this business has gone largely to western mills. While some orders are bringing better prices, there have been recent sales at low figures. We quote the rail market as follows:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails in lots up to 250 tons, 8-pound, $29; 12-pound, $28; 16 to 25-pound, $27; 30 to 35-pound, $26.75, 40 to 45-pound, $26; on lots over 250 tons, prices are 60c less, and over 500 tons, $1 less; angle splice bars for standard sections, 1.50c Pittsburg; standard spikes, 1.60c to 1.70c Pittsburg; hand spikes, 1.60c to 1.70c Pittsburg.

Steel.—The rather sudden influx of orders for finished material during the past month found some leading companies to be short of their steel requirements, and there has been some buying of billets between companies. Open-hearth steel has been especially in demand, and this has resulted in the firming up of billet prices which have been irregular. The sheet bar market has also hardened from the instability of the past several months, when contracts were made as low as $23.50 delivered in the Pittsburg zone. At the present time, some sheet and tin plate companies which postponed the covering of their needs, are finding trouble in buying for the extended future at advantageous prices. The Carnegie Steel Co. is now furnishing the American Sheet & Tin Plate Co. more than 100,000 tons of steel monthly, which is principally in sheet bars.

Bessemer and open-hearth 4 x 4 billets with 0.25 carbon and less are regularly quoted at $23 Pittsburg, with the usual extras for size and analysis, and forging billets at $25 to $27 Pittsburg. The regular quotation on sheet and tin bars is $25 Pittsburg, but prompt material has been sold and some contracts made at about $1 under this price. Steel makers divide with consumers the freight within the $1 limit, making the price in such territory $23.50 delivered on billets, and $25.50 delivered on sheet bars.

Hoops and Bands.—Better specifications against contracts are being received in hoops, but new business is not heavy. Prices are showing more firmness, but there is still some shading in the market. We quote the present market as follows:

Hoops in carload lots, 1.40c to 1.50c; in less than carload lots, 1.50c to 1.60c; bands, 1.20c, base half extras as per standard steel.

Merchant Bars.—The heavy movement in steel bars during the month of May is continuing at the present time, and it appears conclusive that general consumption is expanding. This seems especially true among manufacturing users, with whom stocks are low, but with some of the jobbers there is increased ordering for store. The present attitude of steel bar makers is one of conservatism in booking new business for extended shipment, which reflects favorably upon the condition of well filled order books. A number of the leading companies continue to quote 1.25c Pittsburg while others are holding the market at 1.20c, but are not actively seeking business. The Republic Iron & Steel Co. and the Jones & Laughlin Steel Co. are running their steel works capacity practically full, and the Carnegie Steel Co. has inactive only one regular bar mill, Greenville, which may be started at any time. Bar iron is showing some improvement, but business is not heavy. Some recent sales of shafting have been made at better prices. We quote the present market as follows:

Common iron bars, 1.30c to 1.35c Pittsburg; Bessemer and open-hearth steel bars, 1.20c to 1.25c; plow and cultivator, 1.20c to 1.25c; channels, angles, zees, tees, under 3-inch, 1.30c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds, 0.10c advance; less than 1,000 pounds of a size, 0.30c advance. Cold rolled and ground shafting, 60 per cent in carloads, and 55 per cent in less than carloads, delivered in base territory. Planished and machine straightened tire is 1.40c base; iron finished tire under 1½ by 1½ inches, 1.35c, both plus ½ extra on tire card; iron finished tire, 1½ x ½ and over, 1.20c plus ½ extra on the steel bar card.

On cold rolled strip steel, width 1½ inches and wider, and 0.100 inch and thicker, we quote base prices for 100 pounds, $3.05 on hard, and $3.30 on soft.

Structural Material.—Some of the large makers of plain material find their order books so well filled that they are not inclined to take an additional tonnage at the present market, and as a consequence are elevating their asking prices. One of these, the Jones & Laughlin Steel Co. is now

quoting 1.35c on plates and shapes and other companies are asking the same figure except on very attractive orders. This is a distinct advance over any price that has ruled since the declaration of the open market. The inquiry in new structural undertakings outside of that from the railroads is good, and numerous commercial and industrial contracts are taking figures. The railroads, however, have been supporting the market fairly well, and additional heavy offerings are not expected from this source. There is little evidence as yet that fabricating prices are improving. Bids are to be asked in the next several weeks on a large public bridge across the Ohio river at Sewickley, Pa., which will require from 5,000 to 6,000 tons. The Jones & Laughlin Steel Co. has taken the Elliott-Taylor-Woolfenden Co. building, Detroit, 1,000 tons. Inquiries are out for the steel for several large bridges on the Pacific coast, one of which is at Seattle, Wash. The Philadelphia & Reading railroad is figuring on additional elevation work at Philadelphia, which will require about 5,000 tons. We quote the present market on structural shapes as follows:

Beams and channels, 15-inch and under, 1.25c to 1.30c; over 15 inches, 1.35c to 1.40c; zees, 1.25c to 1.30c; tees, 1.30c to 1.35c; angles, from 3 to 6 inches, 1.25c to 1.30c; over 6 inches, 1.35c to 1.40c; universal and sheared plates, 6¼ inches wide and wider, 1.25c to 1.30c.

Merchant Pipe.—The report that the People's Natural Gas Co. had closed on its recent inquiry for 60 miles of 14-inch for a gas line to Altoona, Pa., is not confirmed. The Barnsdall interests have bought 20 miles of from 2 to 8-inch line pipe and oil and gas field goods for delivery at various points, and the Philadelphia Co. has placed 26 miles of iron pipe, 8 inches and smaller, for a gas line. The Jennings interests have taken a large assortment of oil field goods for Illinois delivery. The National Gas Co. of West Virginia is figuring on 15 miles of 8-inch pipe for a gas line, and the Manufacturers' Light & Heat Co. is in the market for 10 to 12 miles of 6-inch steel line. The May bookings in pipe with the leading interest and many of the independents were the heaviest of any similar month in their history, and offerings to date are still very large. There is not a great deal of stocking outside of the large jobbers, and consumption has materially increased. Deliveries are becoming backward, but the mills are not inclined to take orders for more than 30 days ahead. The National Tube Co. this week is getting the finishing end of its Riverside works in operation, two pipe furnaces having been started, and the entire capacity of the plant, six furnaces, will be put on as soon as the organization is perfected. Merchant pipe prices are firm. We quote the following official discounts on merchant pipe subject to an additional one point and five off to jobbers:

	—Steel—		—Iron—	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch.....	72	56	69	..
⅜ inch	73	59	70	56
½ inch	76	64	73	61
¾ to 6 inch.....	80	70	77	67
7 to 12 inch.....	75	60	72	57
PLUGGED AND REAMED.				
1 to 4 inch.....	78	68	75	65
EXTRA STRONG PLAIN ENDS.				
⅛ to ⅜ inch.....	65	53	62	50
½ to 4 inch.....	72	60	59	57
4½ to 8 inch.....	68	56	65	53
DOUBLE EXTRA STRONG PLAIN ENDS.				
½ to 8 inch.....	61	50	58	47

Boiler Tubes.—Some business is now being closed in boiler tubes, but considerable producing capacity is idle. Iron tube makers report very fair conditions. We quote the following official discounts on lap-welded steel boiler tubes to jobbers in carloads:

1 to 1½ inch.....	50
1¾ to 2¼ inch.....	62
2½ inch	64
2¾ to 5 inch.....	70
6 to 13 inch	62

2½ inch and smaller, over 18 feet, 10 per cent net extra.
2¾ inch and larger, over 22 feet, 10 per cent net extra.
To destinations east of the Mississippi river will be sold at delivered discount for carloads lowered by two points, for lengths 22 feet and under; longer lenghts, f. o. b. Pittsburg.

We quote the following official discounts on charcoal iron tubes to jobbers:

1 to 1½ inch.....	45
1¾ to 2¼ inch.....	45
2½ inch	50
2¾ to 5 inch	57
6 to 13 inch.....	45

Wire Products.—The wire mills are now working on the large tonnage, most of which was entered in the several weeks preceding the advance of $2 a ton effective May 17. This movement was extremely heavy and orders ran into the hundreds of thousands of tons. Since the advance, there has also been considerable ordering. The manufacturers and jobbers have taken advantage of the low prices to replenish their stocks, but it is also indicated that consumption has been enlarged. The demand for plain wire and nails is particularly strong. The mills are not desirous of making contracts at the present level. We quote the present market on wire products as follows:

Wire nails, jobbers' carload lots, $1.70; retailers' carload lots, $1.75; painted barb wire, jobbers' carload lots, $1.70; retailers' carload lots, $1.75, with 30c for galvanizing; plain wire to jobbers in carloads, $1.50, and to retailers in carloads, $1.55; polished staples, $1.70; galvanized staples, $2.

Wire Rods.—The rod tonnage in this district has been generally booked at the market before the recent advance, and liberal specifications are now being received. Present prices are quoted at $28 to $29 on Bessemer and $29 to $30 on open-hearth rods.

Coke.—Most of the blast furnaces which expect to be in operation over the last half have covered for their coke requirements through that period. If pig iron prices advance to the point where idle furnace capacity is fired, additional coke buying will follow, but under present conditions it is believed the principal movement is over. Some requirement foundry coke contracts are being placed, but this buying is not as brisk as it has been. A prominent local consumer is in the market for its requirements from July to July. Some coke companies report heavy shipments on contracts. Increased furnace activities of the United States Steel Corporation have caused the H. C. Frick Coke Co. to fire several thousand additional ovens in the past three weeks. We quote spot furnace coke at from $1.50 to $1.60 ovens, and on contract from $1.60 to $1.70 ovens, according to grade. On first-class Connellsville foundry coke, the range is from $1.80 to $2 ovens for prompt shipment, and on contract from $1.90 to $2.25 ovens. The *Courier's* figures for the week ending May 29 show 24,646 ovens active with an output of 284,866 tons, compared with 24,090 active ovens and a production of 278,729 tons the previous week.

Old Material.—There has been some buying of heavy steel by open-hearth interests in this territory at about the quoted market or higher, and these melters with stocks in their yards are now showing no active interest in the market. While the dealers are still anticipating higher prices, offerings from them appear easier. Eastern users have been buying bundled sheet scrap. A large local consumer of turnings and borings has been in this market the past week. Railroad lists of about the usual tonnage will close this week. The Pennsylvania is offering 9,000 tons of old rails, and the Baltimore & Ohio about 1,500 tons. We quote gross tons delivered in the Pittsburg district as follows:

Heavy melting scrap, $15.75 to $16.50; re-rolling rails, $15.75 to $16.25; bundled sheet scrap, $13 to $13.50; iron axles, $21 to $22; old iron rails, $18 to $18.50; No. 1 wrought scrap, $15.50 to $16; old car wheels, $16 to $16.50; low phosphorus, $18.50 to $19; machine shop

turnings, $11.50 to $12; cast borings, $9.50 to $10; No. 1 cast scrap, $15 to $15.50; malleable, $15 to $15.50; stove plate, $11.50 to $12.

CHICAGO.

Heavy Buying and Urgent Calls for Delivery Characterize the Market.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, June 8.

There are fewer weak spots in the market today than were apparent a couple of weeks ago, and all signs betoken an early return to old-time conditions in the steel trade. The price cutting, recently so prevalent, has been narrowed down and doubtless would have been eliminated altogether but for the advent of one or two new mills which are desirous of securing some tonnage before they commence rolling. One local structural mill has specifications in hand that will take its entire output for the next three months, and is so crowded for deliveries that a portion of its tonnage will have to be rolled in Pittsburg. The rail mill at South Chicago entered June with a larger tonnage on its books than it has had in two or three years and within the last week had added nearly 100,000 tons more of standard sections for delivery this year. The same interest has all the plate specifications it can comfortably handle up to August; while on steel bars its shipping instructions greatly exceed its output for two or three months. The only weakness is in sheets, fabricated material and the lighter sizes of plates. On fabricated material, the cutting continues wide and deep, especially if the contract is a desirable one; but on sheets and plates the concessions are mostly confined to absorbing part of the freight rate. Railroads have been the heaviest buyers in the week under review, conspicuous among the contracts closed being the Harriman rail requirements, amounting substantially to 150,000 tons. Contracts were also closed for an aggregate of 10,000 tons of fabricated material, one-half of which was railroad business. In addition, western car builders have placed orders for a very large tonnage of axle billets. The surprising and most hopeful sign of all this buying is that everybody wants his material as quickly as possible. Even railroads are crowding mills for shipments of rails and structurals. The large stocks which the American Steel & Wire Co. had accumulated during the recent depression have been entirely depleted, and the daily output now goes into immediate consumption. Bar iron is firmer and the minimum price today is $1 higher than a week ago.

Pig Iron.—The buying of foundry irons is progressing satisfactorily. No price changes have occurred in the past week, but a large tonnage, made up of small orders, has changed hands and the market is appreciably stiffer. Two large orders are being figured on by local sellers, one for 5,000 tons of foundry grades, and another for 4,000 tons of malleable Bessemer. One lot of 3,000 tons of Lake Superior charcoal was sold on the basis of $19.50 Chicago. The northern furnaces continue to offer their output for the remainder of the year at $16 furnace, which means $16.50 Chicago. It is still possible to secure southern irons at $11.50 Birmingham for No. 2 foundry, but only one interest is known to be willing to sell at this price for any delivery up to Dec. 31. Most of the southern furnaces are not desirous of selling at any price beyond the third quarter, and even for this shipment inquiries must first be submitted to the home office before a quotation can be made. Malleable foundries are the most delinquent in taking out tonnage and these are confined to shops having a preponderance of railroad work. Otherwise, the melt is up to contract proportions. We quote for Chicago delivery, as follows:

Lake Superior charcoal	$19.50 to 20.00
Northern foundry No. 1	17.00 to 17.50
Northern foundry No. 2	16.50 to 17.00
Northern foundry No. 3	16.00 to 16.50
Southern foundry No. 1	16.35 to 16.85
Southern foundry No. 2	15.85 to 16.35
Southern foundry No. 3	15.35 to 15.85
Southern foundry No. 4	14.85 to 15.35
Southern No. 1 soft	16.35 to 16.85
Southern No. 2 soft	15.85 to 16.35
Southern gray forge	13.85 to 14.35
Southern mottled	13.60 to 14.10
Southern silveries, 4 per cent silicon	17.35 to 17.85
Southern silveries, 5 per cent silicon	17.85 to 18.35
Southern silveries, 6 per cent silicon	18.85 to 19.85
Jackson Co. silveries, 6 per cent	19.90
Jackson Co. silveries, 8 per cent	20.90
Jackson Co. silveries, 10 per cent	21.90
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	17.00 to 17.50
Alabama basic	16.35 to 16.85

Billets.—Car companies and fabricating concerns in the local district contracted last week for a round tonnage of axle billets. Other forms of intermediate steel remain quiet. Local mills are not actively seeking new tonnage on either rods or forging billets, but are more largely turning their output into finished materials, for which the demand is constantly increasing. Prices are without change, and we quote for Chicago delivery, 4 x 4 rolling billets, $24, and forging billets, $26 base.

Merchant Bars.—Specifications are very free for steel bars. All kinds of deliveries are asked for, in some instances as far ahead as 1910; but in the majority of cases the demand is for immediate shipment. Many of the latter are of an urgent character, indicative of low stocks and an improving demand for the finished product. Some of the mills have their rolling schedules filled for several weeks, and night and day turns will be required all summer to keep pace with the demands of the trade. Bar iron is also stronger and consumption is greater. Nothing better than 1.30c Chicago can be done, and this only on business for prompt shipment. For deliveries in July and August, the price will range from 50 cents to $1 a ton higher, and no mill will sell for any delivery beyond October. The failure to reach an agreement with the Amalgamated Association at the last conference in May, together with the numerous evidences of improving conditions all along the line, may be responsible for this position. Certainly, not in months, or for two years, has the iron and steel business the prosperous appearance it has today, and it is confidently believed that the lowest prices for this year have been seen. There is a fair tonnage in hard steel, the local quotation today ranging from 1.25c to 1.30c. We quote:

Soft steel bars and bands, 1.35c to 1.38c, half extras; soft steel angles, less than 3 x 3, 1.48c; hoops, 1.78c base, full extras; planished or smooth finished tire steel, 1.58c; iron finish, up to 1½ x ½-inch, 1.53c base tire card; iron finish, 1½ x ½-inch and larger, 1.38c base steel card; channel for solid rubber tire, ¾ to 1 inch, 1.88c, and 1⅛-inch and larger, 1.78c; smooth-finished machinery steel, 1.63c; flat sleigh shoe, 1.43c; concave and convex sleigh shoe, 1.63c; cutter shoe, 2.75c; toe calk steel, 1.93c; railway spring, 1.73c, base steel card; vehicle spring steel, 1.78c, base vehicle card; crucible tool steel, 7c to 9c, with higher prices asked on special grades. Quotations on shafting are 60 per cent off the list for carload lots, and 55 per cent off for less than carload lots, carload freight allowed to points in base territory. On iron and steel bars from local stocks, we quote as follows: Bar iron, 1.70c to 1.80c full extras; soft steel bars, 1.50c per 100 pounds base, plus half extras; soft steel hoops, 2.10c, full extras.

Plates.—The current orders for plates are of an excellent character. On all heavy gages, there is less disposition to shade the freight rate to an even 15c, though this cutting still remains

common on the lighter weights. The Illinois Steel Co. has all the plate tonnage it can comfortably take care of for some time to come, and is restricting the deliveries for which it will contract. Orders must either be accompanied by specifications or followed shortly by them; otherwise, the business is declined. The tonnage booked, is fairly well distributed among the different branches of trade, and this is evidence of a widespread resumption of business.

For mill prices see Pittsburg report. Freight to Chicago, 18 cents. We quote for shipment from local stocks as follows:

Tank steel, ¼-inch and heavier, up to 72 inches wide, 1.60c to 1.70c; from 72 inches wide to 96 inches wide, 1.70c to 1.80c; 3/16-inch up to and including 60 inches wide, 1.70c to 1.75c; 72 inches wide, 1.95c to 2c; No. 8 up to 60 inches wide, 1.70c to 1.75c. Flange and head quality, 25c extra.

Sheets.—Conditions locally have been somewhat unsettled owing to the advent of several Ohio mills into the market. In their desire to secure business, these interests have not hesitated to shade prices, the cutting ranging from 50 cents to $1.50 a ton, according to the exigencies of the situation. It has had the good effect, however, of bringing out considerable business that might not have developed for several weeks, for it is the general belief that the turn in the market has arrived. Specifications for black and galvanized sheets are very active, the consumption of the latter being especially good owing to the open weather prevailing. Store trade is also improving.

For mill prices, see Pittsburg report. Freight to Chicago, 18 cents. We quote store prices at Chicago as follows:

No. 10, 2c to 2.10c; No. 12, 2.05 to 2.15c; No. 14, 2.10c to 2.20c; No. 16, 2.20c to 2.30c; Nos. 18-20, 2.50c to 2.55c; Nos. 22-24, 2.55c to 2.60c; No. 26, 2.60c to 2.65c; No. 27, 2.65c to 2.70c; No. 28, 2.75c to 2.80c; No. 30, 3.05c; galvanized sheets, Nos. 10 to 16, 3c to 3.10c; Nos. 18 to 20, 3.05c to 3.15c; Nos. 22 to 24, 3.20c to 3.25c; No. 26, 3.40c to 3.45c; No. 27, 3.60c to 3.65c; No. 28, 3.80c to 3.90c; No. 30, 4.20c to 4.50c.

Structural Steel.—While the volume of new tonnage and specifications has immensely improved, it is still possible to secure concessions in price to the extent of shading the freight rate between Pittsburg and Chicago; 3c, or from 18c to 15c. This feature may be less common than a few weeks ago, but it is yet a frequent occurrence. The cutting on fabricated contracts is deeper and more widespread; in fact, there has been little or no price improvement in this material in two or three months, despite the fact that the larger interests are rapidly filling up. Last week's business was very good. The American Bridge Co. secured a contract from the C., M. & St. P. Railway for a 1,360-ton viaduct at Hanson Creek, Wash., and the Toledo & Massillon Bridge Co. secured a contract for 750 tons of steel work from the same company to be erected at Milwaukee. The King Bridge Co., Cleveland, secured a contract from the M., K. & T. Railway for 2,000 tons of fabricated material; the Wisconsin Steel and Iron Works, Milwaukee, of 1,000 tons from the C., M. & St. P. Ry., and the Stroebel Steel Construction Co., Chicago, received a 500-ton contract from the Monon railroad. The contract for the steel for the Chamberlain building, Chicago, 1,200 tons, was let to George W. Jackson, Inc., of this city; the Des Moines Bridge & Iron Works, Des Moines, Ia., 300 tons, for an addition to the power station of the Des Moines Electric Co.; Modern Steel Structural Co., Waukesha, 135 tons, for the Schindler theater, Chicago, and 160 tons for an addition to a Chicago brewery; Kansas City Structural Steel Co., 220 tons for the Halpin building, Kansas City; and the Wisconsin Bridge & Iron Works, 120 tons for a 5-story Chicago warehouse. A new office building to be erected in Detroit, the steel requirements of which will be 4,500 tons, is being figured on, and bids are shortly expected on a one million dollar addition to the plant of the Standard Steel Car Works at Hammond, Ind. Bids for the highway bridge that is to be erected across the Willamette river at Portland, Ore., are expected the first of next month, but it is indefinite when the bids for the railroad bridge across the Columbia river near the same city will be issued. These two structures will require approximately 15,000 tons of steel.

For mill prices see Pittsburg report. Freight to Chicago, 18 cents. We quote from local jobbers' stock as follows:

All angles, 3 inches and larger, including 6 inches, $1.60 per 100 pounds; angles over 6 inches, $1.70 per 100 pounds base; beams, 3 to 15 inches, inclusive, $1.60 per 100 pounds base; channels, 3 inches and larger, $1.60 per 100 pounds base.

Rails and Track Supplies.—Last week proved one of the best in a year for rail tonnage. The Chicago & Alton closed with the Illinois Steel Co. for 9,000 tons of Bessemer rails, to be delivered as quickly as possible; the Missouri Pacific let 35,000 tons (all Bessemer) 19,000 tons going to the Illinois Steel Co. and 16,000 tons to the Carnegie Co. and the Harriman lines closed for 150,000 tons. This order has not yet been divided, but it is understood that one-half of it will go to the local company; the balance will be divided among the other interests, including the Colorado Fuel & Iron Co. All of these rails will be made from Bessemer steel. The Northern Pacific has specified that one-half of its 15,000 tons of rails ordered a week ago shall be open-hearth, and these will be rolled at Gary. All of the railroads are pressing mills for immediate deliveries of their rails; the Harriman interests want them at the rate of 18,000 tons a month. The South Chicago mills are running day and night, the company having orders on its books aggregating 200,000 tons.

The Sheboygan Light, Power & Railway Co., Sheboygan, Wis., is in the market for 500 tons of 60-lb. rails, and the Twin City Electric Railway Co., Ironwood, Mich., for 600 to 700 tons of 60-pound rails. The Detroit & Mackinac R. R. is trying to get immediate shipment of 2,000 tons of standard sections. Light rails and track supplies are both in excellent demand. One order for the former placed with the Illinois Steel Co. last week was for 3,000 tons. Only late deliveries can be given on track bolts. See Pittsburg report for prices on standard sections. On light rails, Chicago delivery, we quote as follows:

Light rails, 40 and 45-pound, $26; 30 and 35-pound, $26.75; 16, 20 and 25-pound, $27; 12-pound, $28. In lots of 250 to 500 tons a reduction of 60 cents a ton from these prices is made; lots of 500 tons and up carry a reduction of $1 a ton. Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; spikes, 1.75c; track bolts, with square nuts, 2.15c to 2.20c; with hexagon nuts, 2.30c to 2.40c; small railroad and square boat spikes, 1.90c base, f. o. b. Chicago.

Merchant Pipe and Boiler Tubes.—The movement in tubular goods is of an uninteresting character, being in the main for hand-to-mouth requirements. Some recovery has been noticed in boiler tubes, but it is very slight. We quote for lap-welded tubes out of store, 65 off, and for charcoal 50 off. For mill discounts, see Pittsburg report.

Cast Iron Pipe.—The usual volume of small orders has been placed, aggregating a fair tonnage. Nothing of any importance, however, has developed. We quote prices as follows: Four-inch water pipe, $27.50; 6 to 14-inch, $26.50; larger sizes, $25.50; gas pipe, $1 a ton higher.

Wire Products.—The volume of business is surprisingly good. On barb wire, the leading interest is falling behind in its deliveries. There is also an excellent demand for smooth wire, the manufacturing trade specifying more freely than in months. Bale ties and nails are active, especially the former. The large stocks which the American Steel & Wire Co. accumulated during the dull months have been entirely depleted, and the daily output is now going into immediate consumption. We quote as follows:

Wire nails, jobbers' carload lots, $1.88; retailers' carload lots, $1.93; retailers, less than carload lots, $2.03; painted barb wire, jobbers' carload lots, $1.88; retailers' carload lots, $1.93, with 30c for galvanizing; plain wire to jobbers in carloads, $1.68; staples, $1.88. Wire rods, Bessemer, $27; open-hearth, $28; chain rods, $27, f. o. b. Pittsburg.

Old Material.—The unwillingness of local melters to contract at prevailing prices seems to have had no appreciable effect on the market. Prices are firmer, if anything, dealers seeming to experience no difficulty in disposing of their stocks in other markets at as good figures as are asked here. The scarcity of turnings and steel scrap is one of the strong props to the present level, Pennsylvania and Ohio mills having bought a considerable tonnage of these materials in this market in the last two weeks. The only new lists out are those of the Baltimore & Ohio for 6,000 tons, and the C., M. & St. P. Railway for 3,000 tons. We have revised our prices and quote gross tons in the first paragraph:

Old car wheels	15.50 to 16.00
Old iron rails	17.50 to 18.00
Rerolling rails (4 ft. and over)	15.50 to 16.00
Old steel rails (4 ft. and under)	14.75 to 15.25
Light section relayers, 45 lbs. and under subject to inspection.	21.00 to 23.00
Relaying rails, subject to inspection	19.00 to 19.50
Frogs, switches and guards	14.50 to 15.00
Heavy melting steel	14.00 to 14.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$13.75 to 14.25
No. 2 R. R. wrought	12.75 to 13.25
Knucklers, couplers and springs	13.25 to 13.75
Shafting	15.75 to 16.25
Iron car axles	18.25 to 18.75
Steel car axles	17.00 to 17.50
Dealers' forge No. 1	11.00 to 11.50
Pipes and flues	10.00 to 10.50
No. 1 cast, 150 lbs. and less	13.75 to 14.25
No. 1 mill	7.25 to 7.75
Mixed bushelling (Nos. 1 and 2)	8.25 to 8.75
No. 1 boiler cut	10.25 to 10.75
Boiler punchings	12.50 to 13.00
Cast borings	6.00 to 6.25
Mixed borings, etc.	6.00 to 6.25
Machine shop turnings	8.00 to 8.50
Railroad malleable	13.00 to 13.50
Agricultural malleable	11.50 to 12.00
Stove plate and light cast scrap	12.00 to 12.50
Old iron splice bars	16.50 to 17.00

CLEVELAND.

Contracts for Furnace Construction and New Buildings.

Office of THE IRON TRADE REVIEW,
Browning Building, June 8.

Iron Ore.—Iron ore interests differ somewhat as to the present condition of the market. Some report that sales are being made at a very fair rate, but others state that practically nothing is being done. On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—No large transactions in pig iron are reported, although a number of sales of 300 and 400-ton lots have been made. The market is firm and local furnaces will not accept less than $15 for outside shipment, while for delivery in the city, $15.25 to $15.50 is obtained. We quote delivered in Cleveland as follows:

No. 1 foundry	$15.75 to 16.00
No. 2 foundry	15.25 to 15.50
No. 3 foundry	14.75 to 15.25
No. 3 southern	15.35 to 15.85
Gray forge	14.00 to 14.50
Bessemer	15.65 to 15.90
Lake Superior charcoal	19.00 to 19.50
Jackson Co. 8 per cent silvery	20.05

Coke.—There is some activity in foundry coke and a number of contracts, some for last half and some for delivery the year ending July 1, 1910, have been made. We quote spot furnace coke at $1.50 to $1.65 at the ovens, and contract $1.70 to $1.75; for first class Connellsville foundry coke, we quote at $1.80 to $2, and on contract $2 to $2.25.

Finished Materials.—The leading interest still adheres to 1.20c Pittsburg on bars and 1.30c on structurals, but several of the large independent companies are asking 1.25c on bars and 1.35c on shapes. Specifications are coming in at a satisfactory rate, but sales are not numerous. The Massillon Bridge & Structural Co. has been awarded the contract for dock sheds at New Orleans, 1,300 tons, at $68,554. The Carnegie Steel Co. will supply the steel. The Massillon company bid 2.62c per pound on 265,000 pounds of steel for one shed, and 2.59c per pound on 1,163,000 pounds of steel for another shed. For the cast iron castings the bid was 3.32c on 1,600 pounds for one shed, and 3.10c on 1,700 pounds for another shed. Corrigan, McKinney & Co. have awarded contracts as follows for their new Cleveland furnace: Stoves to S. W. McClure & Son; blowing engines, to the Wisconsin Engine Co.; sheet work, to the Variety Iron & Steel Works Co.; boilers, to Babcock, Wilcox & Co.; ore bridges, the Brown Hoisting Machinery Co.; bins and trestles and structural work, about 1,500 tons, to the Van Dorn Iron Works; electrical equipment, to the Crocker-Wheeler Co., and the Ball Engine Co.; and Hulett ore unloaders, Wellman-Seaver-Morgan Co. T. H. Brooks & Co. have taken the contract for the Anisfield building at Huron road and Ninth street, and the Brown building on Euclid avenue. It has not yet been decided whether the latter building will be five or 15 stories. The Bourne-Fuller Co. will furnish Carnegie shapes for the Anisfield building, about 500 tons. Competition on rivets is still very active, and as low as 1.55c has been done. While bar iron has not shown much improvement in harmony with the change for the better in steel bars, it is now difficult to get the latter in less than three weeks, and iron is being used in some cases in place of steel. The usual quotation on bar iron is 1.30c Cleveland mills. There is some irregularity in lighter gages of sheets, in shafting and in spikes.

Old Material.—The tendency toward quietness which the market developed the past week was not entirely unexpected, since the season is approaching for the usual midsummer closing down of the largest consumers' plants. In several lines, such as turnings and steel axles, an advance of 50 cents a ton was noted. We quote f. o. b. Cleveland as follows:

Old iron rails	$16.50 to 17.00
Old steel rails (re-rolling)	15.00 to 15.50
Old steel rails (under 6 feet)	15.00 to 15.50
Old car wheels	15.50 to 16.00
Old steel boiler plate	12.50 to 13.00
Mallable iron (railroad)	14.00 to 14.50
Steel axles	18.00 to 18.50
Malleable iron (agricultural)	13.00 to 13.50
Heavy steel	14.25 to 14.75
Country mixed steel	13.00 to 13.50
Low phosphorus	16.00 to 16.50

We quote, net tons, as follows:

No. 1 R. R. wrought	$14.00 to 14.50
No. 1 busheling	12.00 to 12.50
No. 1 machine cast	12.50 to 13.00
Iron axles	17.50 to 18.00
Axle turnings	9.50 to 10.00
Machine shop turnings	8.50 to 9.00
Grate bars	11.00 to 11.50
Pipes and flues	11.50 to 12.00
Tank iron	10.00 to 10.50
Hoop and band iron	9.00 to 9.50
Sheet iron	8.00 to 8.50
Wrought drilling	8.50 to 9.00
Stove plate	11.00 to 11.50
Cast borings	7.50 to 8.00

NEW YORK.

Good Demand for Foundry Pig Iron in Small Lots.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., June 8.

Pig Iron.—The market displays the same firm tone as a week ago and the run of business is quite similar to what it was at that time. Prices are strong and show practically no change. The most interesting item is three inquiries from eastern Pennsylvania territory for gray forge, which aggregated 30,000 tons. There were one or two sales in the past week of lots of 1,000 to 2,000 tons of foundry iron, but, for the most part, while the total business was quite satisfactory, the individual tonnages were small. The heaviest demand was for foundry grades, a considerable portion of which was for New England delivery. The indications are that melters have struck a gait which seemingly is good for from 30 to 60 days and the belief is quite generally expressed that the fall will see an increase all along the line. Deliveries of iron show a steady betterment and even though the market may naturally be expected to quiet down occasionally during the summer, as buyers fill their needs, there is no one who is not most optimistic regarding the outlook. There have been no further sales of note in steel making grades, though several small lots of low phosphorus, running from 100 to 300 tons each, have been closed. We quote:

Northern foundry No. 1	$17.00 to 17.50
No. 2X foundry	16.50 to 17.00
No. 2 plain	16.00 to 16.50
No. 2 southern foundry	16.00 to 16.50
Malleable	17.25 to 17.75
Gray forge	15.25 to 15.75

Ferro-Alloys.—We note the sale of 1,200 tons of ferro-manganese at a price less than $42, plus $4 duty, f. o. b. Baltimore, for delivery the first half of next year. A sale for 1909 delivery was made at $40.50. There was also a sale of 600 tons at $41. A fair amount of inquiry for ferro-silicon is on hand and some 2,000 tons of ferro-manganese were inquired for one day this week.

Finished Materials.—Much pending business in structural lines is to be placed within the next day or two. Whether bids will be re-advertised for the sub-structure of the new New York post office has not been determined. Two of the bidders have already withdrawn and the proposition is now up to Chas. H. Peckworth, the next lowest bidder in line. The Eastern Steel Co. has been awarded the contract for the new hotel to be erected on the site of the Hotel Metropole, Forty-second street and Broadway. This structure is eventually to be 30 stories high. Only six stories and tower are to be constructed at present, involving 1,000 tons. The same company was awarded 900 tons for a loft building on Fourth street. The Maryland Steel Co. is to build three vessels for the American-Hawaiian Steamship Co. and two other smaller ones for another line. This company is said to have refused further similar business on account of press of orders. Other contracts placed were 1,000 tons for the Brandeis theater and office building, Omaha, a 500-ton loft building on 149th street, New York City, to Hinkle Works; 450 tons for the Schenectady court house, to the Cambria Steel Co. Among new inquiries are 3,200 tons for a city hospital at San Francisco, 2,000 for Denver Gas & Electric Co., Denver; 2,000 tons of bridges for the New York, Westchester & Boston Electric Railway, to be erected between West Farms and New Rochelle, N. Y. Bids have been asked for a reinforced concrete municipal causeway to be built across Galveston bay, Galveston, Tex. The structure will be 10,600 feet long, including an arch bridge 2,472 feet, as well as a lift bridge of 100 feet. The tonnage will be about 4,000. The Jersey Central's order for 1,500 steel cars has virtually been placed with the Cambria Steel Co. Late orders include 600 cars for the M., K. & T. and 500 more cars for the C. & O. We quote:

Angles, 3 to 6 inches x ¼-inch and heavier, 1.46c; beams, 3 to 15 inches, 1.46c; tees, 3 x ¼-inch and heavier, 1.51c; plates, carloads tank, 1.46c; marine boiler, 1.86c; bar iron, 1.35c to 1.40c; soft steel bars, 1.36c; sheets, No. 28 black, 2.56c.

Cast Iron Pipe.—Bids are to be opened late Wednesday on 15,000 tons for the New York high pressure fire system.

Old Materials.—The market is active and prices continue to show advances. One sale of 5,000 tons of heavy steel at $16, delivered, is noted. Some 30,000 tons are offered by the railroads. We quote:

Old steel rails (rerolling)	$13.50 to 14.50
Relaying rails	19.00 to 19.50
Old car wheels	13.00 to 13.50
Old iron car axles	18.50 to 19.00
Old steel car axles	16.00 to 16.50
Heavy melting steel	13.00 to 13.50
No. 1 railroad wrought	15.50 to 16.00
Iron track scrap	13.50 to 14.00
Wrought pipe	12.00 to 12.50
Cast borings	7.50 to 8.00
Wrought turnings	9.00 to 9.50
Heavy cast scrap	12.50 to 13.00
Railroad malleable	11.50 to 12.00
Stove plate	10.00 to 10.50
Grate bars	10.00 to 10.50

The Norton Iron Works blew out its furnace at Ashland, Ky., May 31.

Rebecca stack of the Kittanning Iron & Steel Co. was blown out May 25.

CINCINNATI.

More Inquiry, With Prices Firm, But Sales Are Not Heavy.

Office of THE IRON TRADE REVIEW, First National Bank Bldg., June 8.

Pig Iron.—The inquiry the past week is more general than in the preceding one, but the record of sales is rather light. A Dayton, O., melter is in the market for 1,000 tons of northern iron for last half delivery. A Michigan melter is inquiring for 600 tons of foundry iron and 100 tons of high silicon, deliveries extending from September to January. A northern Ohio consumer is in the market for 500 tons of northern and 150 tons of southern for last half delivery. A melter at Springfield, O., bought about 1,000 tons during the week of northern and southern at schedule prices, for deliveries in the next four months. An eastern melter is asking for prices on 1,000 tons of malleable and an Indiana rolling mill is figuring on 2,000 tons of gray forge. An Ohio melter is in the market for 1,000 tons of southern foundry. There is also a fairly good scattered inquiry outside of this territory under consideration through Cincinnati offices. The price situation so far as forward delivery is concerned is unchanged, but prompt shipment iron is stronger in tone, as the furnaces are naturally interested in holding the market a little higher for prompt delivery than the prices at which third quarter and last half business was taken. It is therefore difficult to find a furnace company that is willing to quote less than $11.50 Birmingham for southern iron for prompt shipment and northern furnaces in southern Ohio are holding at $14.50 for No. 2 foundry quite generally. In the Ironton district, No. 1 foundry and No. 3 foundry can be had at slight concessions, as there appears to be a little surplus of these grades, but malleable and No. 2 foundry are firmly held. There are persistent rumors and reports of prompt shipment southern iron selling at $11 Birmingham, but this does not seem to be furnace iron. There has been a small tonnage of resale iron offered at $11 and an occasional sale at $11.25 has been reported, but the tonnage offering below $11.50 Birmingham is insignificant and with furnaces particularly interested in maintaining $11.50 Birmingham basis in order to furnish inducement to consumers to take in recent purchases of $11 iron for the last half, it seems reasonable to regard the spot market as quotably firmer. One important interest in the south which has been selling

at $11 for prompt shipment has advanced to the $11.50 basis during the week. We quote for prompt shipment and for delivery through the remainder of June as follows, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton.

Southern foundry No. 1	$15.00 to 15.25
Southern foundry No. 2	14.50 to 14.75
Southern foundry No. 3	14.00 to 14.25
Southern foundry No. 4	13.75
Southern No. 1 soft	15.00 to 15.25
Southern No. 2 soft	14.50 to 14.75
Southern gray forge	13.50 to 14.00
Northern No. 1 foundry	15.95 to 16.20
Northern No. 2 foundry	15.70
Northern No. 3 foundry	14.95 to 15.20
Jackson county 6 per cent silicon	18.70
Jackson county 8 per cent silicon	19.70
Jackson county 10 per cent silicon	20.70

Finished Material.—The market is steady to firm in tone and the mills seem more inclined to advance the price of steel bars to the $1.25 basis, which is now maintained by several large interests. Specifications on contracts are fairly good and the general market has a firm tendency.

Coke.—Some of the low prices for spot coke in the Connellsville district have disappeared and shipments have been heavier. The market is slightly stronger, but prices on contract coke are unchanged. The following quotations represent prices at the ovens in the leading districts, the inside figures being the prompt shipment quotations and the outside figures contract prices for the best grades:

	Per Ton.
Wise county furnace coke	$1.60 to 1.85
Wise county foundry coke	2.00 to 2.25
Pocahontas furnace coke	1.75 to 1.85
Pocahontas foundry coke	1.85 to 2.25
Standard Connellsville furnace coke	1.75 to 2.00
Standard Connellsville foundry coke	2.00 to 2.50

Old Material.—Dealers continue firm in their views and are paying rather full prices for machine scrap. Heavy melting steel is not quotably changed. Some grades of scrap are now above the pig iron basis and occasionally we hear of pig iron being substituted for scrap. Dealers' prices to consumers here are as follows:

Old No. 1 R. R. wrought net tons	$13 50 to 14.00
No. 1 machinery, net tons	13.00 to 13.50
Old iron rails, gross tons	15.50 to 16.50
Old steel rails (re-rolling) gross tons	14.50 to 15.00
Old short lengths, gross tons	14.00 to 14 50
Old iron axles, net tons	17.00 to 17.50
Heavy melting scrap, gross tons	13.25 to 14.00
Stove plate, net tons	11.00 to 11.50
Heavy trimmings, net	9.00 to 9.50
Cast borings, net tons	6 50 to 7.50
Car wheels	14 50 to 15.00

PHILADELPHIA.

Buying of Pig Iron Not so Active—Higher Prices on Some Finished Products.

June 8.

Pig Iron.—Though the market experienced somewhat of a let-up last week from the May buying movement, there was a considerable tonnage placed in the aggregate and on the whole conditions are considered to be comparatively strong. There was some further buying of basic. One interest that was in the market for 7,500 tons closed for at least 2,000 of that amount at $15.50. A sale of 1,000 tons of foundry iron to a railroad equipment interest at the prevailing market price is noted, while another 1,000 was taken by a general foundry. One purchaser bought No. 2X at $16.75, while another declined to do so at $16.50. It is reported that a nearby pipe foundry has closed for 15,000 tons at $15.50, but no verification of this could be obtained. The general feeling of furnacemen is most hopeful and the belief is expressed that the near future will see a big development in buying and higher prices are expected. Stocks, as a rule, are low in furnace yards. While no additional stacks have been blown in, yet things are in readiness to place them in commission when the demand comes. Southern iron is not active. Virginia iron is scarce, though there have been some small sales of this grade at market prices. We quote, Eastern Pennsylvania delivery during third quarter as follows:

No. 1X foundry	$17.00 to 17.50
No. 2X foundry	16.50 to 17.00
No. 2 plain	16.00 to 16.50
Standard gray forge	15.25 to 15.75
Basic	15.50
Low phosphorus	19.00 to 20.00
No. 2 Birmingham	15.75 to 16.25
No. 2X Virginia	16.75 to 17.25
No. 2 plain Virginia	16.25 to 16.75

Finished Materials.—Prices for finished materials have stiffened and in some instances advanced. Some of the larger mills are asking increases over last week's figures for current delivery, while still higher premiums are asked for fourth quarter. Business in plates, bars and shapes is more active, though no particularly large tonnages have been placed. Bids have been asked for a new building of the Philadelphia Warehousing & Cold Storage Co., for which from 600 to 700 tons will be required. We quote as follows: Structural shapes, 1.45c to 1.55c; plates, 1.45c to 1.55c; sheets, No. 28, 2.80c; steel bars, 1.35c to 1.45c; refined bar iron 1.40c to 1.50c.

Old Materials.—Scrap dealers continue to advance their prices and as a rule are holding their stocks in anticipation of a better market. Mills are active along the line of inquiry, but no notable buying has developed. We quote:

Old steel rails (re-rolling)	$16.75 to 17.25
No. 1 steel scrap	15.50 to 15.75
Old steel axles	20.50 to 21.00
Old iron axles	23.00 to 23.50
Old iron rails	20.00 to 20.50
Old car wheels	15.50 to 16.00
Choice scrap R. R. No. 1 wrought	18.50 to 19.00
No. 1 yard scrap	16.50 to 17.00
Machinery scrap	15.00 to 15.50
Low phosphorus scrap	19.50 to 20.00
Wrought iron pipe	15.50 to 16.00
No. 1 forge fire scrap	13.00 to 13.50
No. 2 forge fire scrap, ordinary	9.50 to 10.00
Wrought turnings	12.50 to 13.00
Axle turnings, heavy	13.00 to 13.50
Cast borings	11.00 to 11.50
Stove plates	13.00 to 13.50

BUFFALO.

Increased Activity in Pig Iron and Finished Material.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, June 8.

Pig Iron.—Activity in pig iron orders is strong and encouraging, showing a healthful tone in business conditions and a likelihood that better business will prevail. Orders the past week were mostly for 500, 700 and 1,000 tons, Buffalo, Rochester and other cities throughout this state producing greater demand. One of the most notable increases in consumption is the case of the General Electric Co., of Schenectady, N. Y., which is breaking a few records at this time. There is no material change in prices at the furnaces, most of the quotations being based on No. 2 and at $14.50 to $15, although the tendency is much firmer. Certain interests will not quote at these figures and some prices are nearly $1 in advance. A large part of the business being placed calls for prompt delivery and a considerable amount of it for third quarter. Smaller tonnage orders are running largely for deliveries before the close of the first half of 1909. We quote, approximately, f. o. b. Buffalo, as follows:

No. 1X foundry	$15.00 to 15.50
No. 2X foundry	14.50 to 15.00
No. 2 plain	14.25 to 14.75
No. 3X foundry	14.00 to 14.50
Malleable Bessemer	16.50 to 17.00
Gray forge	14.00 to 14.50
Charcoal	19.25 to 20.25

Finished Products.—At this point the business activity is fast making up for the long period of depression and orders of late have exceeded expectations. One interest reported today that its Buffalo office booked more business during the month of May than ever before, and in certain quarters business had to be turned away. Finished product mills are greatly crowded and unavoidably behind with orders. Orders are being booked generally with the understanding that deliveries may be delayed considerably. The rush has been for bars and structural shapes. One of the results of this tension in finished material is an agreement which is understood to affect the independent interests here, making a price of 1.25c Pittsburg base on bars, and 1.35c on

plates, small shapes and small structural shapes. Specifications are coming in on small business. The bids will go in this week on the Lafayette hotel addition, one of the largest jobs here at this time.

ST. LOUIS.

Sales of Pig Iron Limited to Small Lots, but Prices are Firm.

June 7.

Pig Iron.—While admitting that sales of pig iron in the St. Louis territory aggregated only about 1,000 tons, all in carlots, with few inquiries out, dealers as a class insist that the market is strong. All of the dealers, however, insist that the price for No. 2 southern is from $11.50 to $12, Birmingham basis, and one furnace is reported to be holding out stiffly for the higher price. One order for 200 tons of southern iron was placed this morning, and a similar one was turned down last week at the same price for shipment up to Jan. 1. Northern iron is in little demand, with price ranges at from $14 to $14.50, valley furnaces. Our quotations delivered, to which the freight of $3.75 from Birmingham has been added, follow:

No. 1 southern	$15.75 to 16.25
No. 2 southern	15.25 to 15.75
No. 3 southern	14.75 to 15.25
No. 4 southern	14.25 to 14.75

Coke.—Not all of the 25,000-ton order for coke, asked for by a large car manufacturing company, has been placed, and some of the 8,000-ton inquiry made by still another concern for foundry coke for delivery over the rest of the year has been placed. Connellsville coke is bringing from $1.85 to $2, ovens, for the best 72-hour foundry grade for immediate shipment, and from $2.15 to $2.25 for delivery over the last half of the year. Connellsville 48-hour furnace coke is still offered at from $1.60 to $1.75 for all deliveries. Virginia and West Virginia grades remain unchanged from last quotations.

Finished Materials.—The demand for standard rails is light, but there is considerable inquiry for angle bars and spikes. The mills are taxed to their capacity to furnish these articles, according to the report of one of the largest interests in the country. Light rails are not much in demand.

Old Material.—The scrap iron market is still manifesting a tendency to brighten up, and dealers are very hopeful. Our quotations follow:

Cast iron borings, free from foreign material, net tons	$ 5.00 to 5.50
Steel axle turnings, gross tons	10.00 to 11.00
Steel railroad axles, net tons	16.50 to 17.00
Iron railroad axles, net tons	17.50 to 18.50
Miscellaneous steel scrap, gross tons	9.00 to 11.00
Old car wheels, gross tons	14.50 to 15.00
No. 1 railroad cast scrap, net tons	11.00 to 11.50
Heavy machinery cast, net tons	12.00 to 12.50
Stove plate and light cast, net tons	10.00 to 10.50
Sheet iron, net tons, uncut	4.00 to 5.00
No. 1 railroad wrought, net tons	12.00 to 13.00
Railroad malleable, net tons	12.00 to 12.50
Heavy melting steel, net tons	11.00 to 12.00
Relaying rails, net tons	17.00 to 18.00

BIRMINGHAM, ALA.

Pig Iron Sales Equal Make—Some Decrease in Production Expected.

June 7.

Pig iron selling by southern manufacturers equals the make right along, the month of June starting in most favorably. There is some inquiry being received and the business that is developing gives signs of a generally improving market. The quotations are still firm, No. 2 foundry being quoted at $11.50 per ton, minimum, delivery during June and July, with $12 per ton being asked for iron to be delivered during the third quarter and later in the year. Two furnaces in this district are ready for the torch whenever the companies desire to apply them. Two other iron makers will be repaired and in condition again by the end of the month. There will be no delay in delivering iron on any and all orders this year. The home consumption is improving slowly but surely, the cast iron and soil pipe people melting a large quantity of pig. The United States Cast Iron Pipe & Foundry Co. was in the market again during the past week for a batch of iron and some of the manufacturers in this section were bidding for the business. The machine shops and foundries are still getting in some business and their general conditions are much better than they have been for many a day.

The steel plant of the Tennessee Coal, Iron & Railroad Co, at Ensley, is still idle, the only information concerning this plant that was given out during the past week being that as soon as orders are received warranting it the big plant, which gives employment to several thousand men, will be started up. The rolling mills of the Tennessee company at Bessemer (working steel), are doing nicely, the daily output being most satisfactory. It is announced that the rolling mills at Helena, Ala., about 16 miles south of Birmingham, will resume operations in about two weeks.

Three iron makers went out of commission last month and one is slated to go out between now and June 15.

We quote scrap as follows:

Old iron rails	$13.00 to 14.00
Old steel axles	12.00 to 12.50
Old steel rails	9.00 to 9.50
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	10.50 to 11.00
No. 1 country	8.00 to 8.50
Heavy melting steel	8.50 to 9.00
Old steel boiler plate	7.00 to 7.50
No. 1 machinery	10.00 to 11.00
Old standard car wheels	12.00 to 12.50
Stove plate	8.50 to 9.00
Cast iron borings	4.00 to 4.50

BRITISH IRON MARKETS.

Eight-Hour Law Expected to Increase Cost of Pig Iron.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., May 22.

There has been a little reaction this week in pig iron, which temporarily brought down Cleveland prices about 1 shilling, although they have since recovered within about 3 pence. A firm tone was reported yesterday, and substantial business was done on the basis of 48s 1d ($11.76) for cash for No. 3 warrants. The amount in stock at present is 216,418 tons. The temporary slump created a bad impression, but nobody supposes it was due to any real giving way in the trade improvement, but solely to speculative operations in which outsiders have been engaged. They apparently had a fit of nerves owing to the slow rate of improvement, and hurriedly got rid of their investments. The pig iron market in Birmingham was slightly weaker on Thursday, for no other reason apparently than that for the present buyers have satisfied their wants, and orders for finished iron are not coming along in satisfactory volume. The market will be strengthened somewhat by a slight deficiency in the amount of Cleveland ore which is being delivered, and everyone is expecting that under the new eight hours' act in July operations will be so affected as to materially raise the price of pig iron. In the hematite trade prices are maintained at 55s 6d ($13.58) for mixed numbers on the East Coast. On the West Coast the improvement is more marked, enabling makers to demand 58s 9d ($14.38). The rather better outlook in the steel trade is strengthening the hematite market.

Finished Material.—Scottish steel makers have been very much disturbed of late by competition in ship plates in England and Wales and on May 21 they met in Glasgow to consider the question of a revision of prices. English and Welsh ship plates, it is said, can be bought below association rates, and the question was raised whether Scotch prices should be re-

duced. The majority decided against this course, and as an alternative a conference is to take place with their competitors below the Tweed, with a view to an understanding as to selling prices.

METAL MARKETS.

ST. LOUIS.

June 7.

Lead and Zinc.—The highest price paid for zinc ore in the Missouri-Kansas-Oklahoma district last week was $46 a ton on an assay base price of $43 a ton. The prevailing price throughout the district was $43 a ton on a base of 60 per cent ore, with numerous bins selling at $43.50. The buying movement was light early in the week, but considerable strength was manifested toward the close, and the indications are good for an equally strong market this week. The Red Dog, the Bulldog and the Dinger, all in the Webb City camp, were among the companies that sold on the $43.50 base. Excellent weather for producers prevailed, and the output was well up to the average. A rumor was prevalent throughout the week that ore prices were weaker, and some of the buyers insisted that the highest price paid was $42.50, but this was stoutly denied.

The St. Louis spelter market showed considerable weakness toward the close of the week, the top price being $5.12½. Lead ore jumped to $59 and $60 a ton for 80 per cent ore, registering a rise of $2 over the prevailing prices of the preceding week. A heavy unloading of ore followed the strong market. St. Louis pig lead quotations at the end of the week were $4.30 and $4.35. Calamine remained unchanged at from $18 to $20 a ton for 40 per cent ore, with a high price of $25 for choice grades.

CHICAGO.

June 8.

There has been a good buying of copper and spelter in the past week, and on copper the tendency is to contract for requirements into August. Both metals have slightly advanced in price. Antimony continues very dull, and there is little doing in the other metals. We quote as follows:

Lake copper, carload lots, 14c to 14¼c; casting, carload lots, 13¾c to 14c; pig tin, 31c to 31½c; spelter, 5.50c to 5.75c; pig lead, desilverized, 4.50c to 4.60c in 50-ton lots; corroding, 4.75c to 4.80c in 50-ton lots; car lots, 2½c per 100 pounds higher; sheet zinc, 6¾c list f. o. b. LaSalle in car lots of 600-pound flasks; Cookson's antimony, 10½c to 11c; other grades, 10c.

Offerings of scrap metal are plentiful, but refiners are not active buyers. Prices remain firm, red brass and zinc having advanced. We quote as follows:

Copper wire, 11¾c to 12c; heavy copper, 11½c to 11¾c; light copper, 10¾c to 11c; heavy red brass, 11c; heavy yellow brass, 8½c; light brass, 6¼c; No. 1 red brass borings, 8¾c; No. 1 yellow brass borings, 7¾c; brass clippings, 8¼c; tea lead, 3.60c; lead scrap, 3.90c; zinc, 3.60c; tin pipe, 24½c; tin foil, 23c; pewter, 17½c; electrotype plates, free from wood, 3.80c; electrotype dross, 2.65c; stereotype plates, 4⅛c; stereotype dross, 3.75c; prime slab zinc dross, $55 per ton.

NEW YORK.

June 8.

Copper.—While business continued very active and transactions were numerous and on a large scale during the early part of the week, the market has quieted down since prices were raised June 1. We quote: Lake, 13⅝c to 13¾c; electrolytic, 13⅜c to 13½c; casting, 13¼c to 13⅜c.

Pig Tin.—The domestic market moved in sympathy with the London market, which was very quiet. We quote 29¼c to 29⅜c, New York.

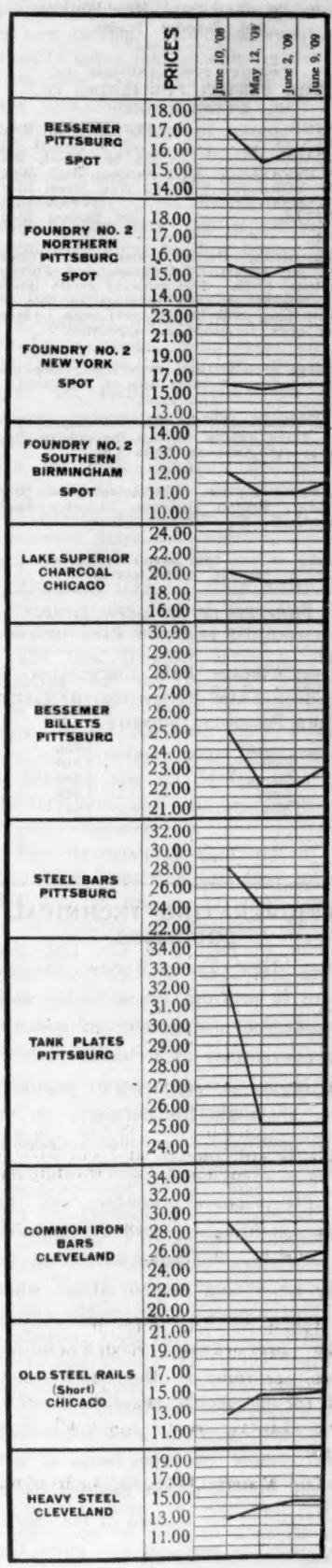
Pig Lead.—The market is firm and the leading sellers have again advanced their price to the extent of $1 a ton, thus making the quotation at New York 4.35c to 4.45c.

Spelter.—The improvement in the steel and iron industry continues to exercise a favorable influence upon the price of spelter. We quote 5.35c to 5.40c, New York.

Antimony.—The market has been dull. We quote Cookson's, 8¼c; United States, 7⅞c; ordinary brands, 7⅜c to 7⅝c.

Exchange of Land.—The Republic Iron & Steel Co. and the Carnegie Steel Co. have concluded a transaction whereby the former acquires a tract of land at Youngstown, O., which adjoins the site upon which it proposes to erect a six-furnace tube works. The Carnegie Steel Co. in return is deeded real estate adjoining its North Sharon works at Sharon, Pa. The land exchange is mutually advantageous to the two companies as providing ground for future extensions.

PRICE CHART.



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January	5,506
February	5,346
March	5,396
April	5,508
May	5,533

June 10, 1909.

REJUVENATING TECHNICAL SOCIETIES.

THE IRON TRADE REVIEW has referred in previous issues to the need of different management in conducting conventions of technical societies and in our last number we reprinted some comments by *Machinery* on the same subject. In this connection some correspondence which originated in *The Engineer*, London, and has been extensively copied is extremely interesting. We have abstracted the first letter and one of those which it called forth we reprint in full. THE IRON TRADE REVIEW believes that the presiding officer of a technical society should be chosen, not as a recognition of his past accomplishments—there are other ways of conferring honors within the gift of the society—but on account of his energy, tact, and as much, if not more than anything else, his ability to bring out the talents of the younger members and encourage active, earnest interest in the proceedings and promote original investigation, otherwise the society is doomed to decay. The letters will be found on page 1080 of this issue.

A BAD EMINENCE.

We reprint elsewhere tables showing the number of boiler explosions recorded in Great Britain and Germany, and the comment of *The Locomotive* in comparing them with the record for the United States. We do not, however, join with *The Locomotive*, which, by the way, is the house organ of a steam boiler inspection and insurance company, in the theory that the showing is due either to difference in prevailing types of boiler or to differing factors of safety. A poorly designed boiler, imperfectly built, is not a better boiler because of a factor of safety of six, say, than another, better designed and built, with a factor of five. It may be many times worse. There is no more mistaken idea than that the ratio of factors of safety determines the actual strength value of a boiler.

The factor of safety is based purely on pressures, whereas there are many other influences at work, many of them even more important, and in many cases the result would be the same even though the factor were doubled.

The real fault lies with "the factor of ignorance," and it is not by any means the exclusive attribute of either maker or user. It should by every right be held responsible for many explosions commonly charged to "criminal carelessness," "greed," "parsimony," "wilful negligence" and other phrases, which the boiler insurance man, no less than the newspaper reporter, has conveniently at hand.

By ignorance we mean not only the lack of accurate knowledge and skill in designing and building and which may cover faulty design, poor material, poor workmanship and inferior appliances, but defective setting and improper operation, in all of which the question of parsimony, etc., may be wholly absent. No man buys a poor boiler to save a few dollars if he clearly understands the risks; he does so in ignorance of the real facts of the case. He may, and often does, pay for a first-class article and gets swindled.

The word boilermaker, too, covers, literally, a multitude of sins, but here again it is chiefly ignorance. Probably nine owners out of ten think that any man calling himself a boilermaker is competent and trusts him and his work accordingly, while it is unfortunately too true that such is far from the fact. Ignorance again, on both sides.

Boiler insurance will not make a good boiler out of a poor one. It will not convert poorly fitted work and unfair and badly driven rivets into good, and heads flanged at too high or too low a heat and unannealed and laid up with the hammer, will not be saved by an insurance policy nor by changing the factor of safety, and ordinary inspection does not disclose them. All these things are manifestations of the "factor of ignorance." Unskillful operation is another.

But in making comparisons between the United States and Europe, particularly Great Britain, it should be remembered that the latter is a small, densely populated country, and the working conditions for steam boilers are consequently not only very different, but intimate knowledge of their proper operation is, also as a consequence, far more general.

When we consider that the total area of the United Kingdom is less than one-third that of the state of Texas and that its population is approximately one-third that of the entire United States, it will readily be gathered that on the one hand boilers in Great Britain are much more easily supervised and have relatively careful attendance, while on the other, in the United States they are scattered widely and often in sparsely settled districts, remote from facilities for repair and where skilful attendance is necessarily impossible to be had. It is no rarity in this country to find

boilers located almost as distant from civilization as one extremity of the United Kingdom is from the other, and we believe *The Locomotive* will bear witness that these outlying plants contribute the larger proportion of the failures. We are not defending United States methods, because technically they are indefensible, but such sweeping and general assertions as those made by *The Locomotive* should take account of conditions as they exist.

AMERICAN AND ENGLISH TIN PLATE.

Editor IRON TRADE REVIEW:

In the report of the meeting of the Iron and Steel Institute in London, published in THE IRON TRADE REVIEW of May 27, 1909, there occurs a sentence, the ambiguity of which may lead to an erroneous conclusion. When speaking of the pin holes which occur in tin plate, the inference is made that in my investigation of the subject I found "less pitting of tin plate in English than in American material." This is in fact not the case. So far as my knowledge goes, American made tin plate is equal to, if not superior to that of the same grade made in England. A statement to the contrary may have constituted a "joke" to "spring" upon an English audience, but it has no basis in fact.

W. H. WALKER.

Director American Institute of Technology, Research Laboratory of Applied Chemistry, Boston, June 5, 1909.

EXCESSIVE TAXATION

Results in Order to Cease Operations at Iron Mines.

Detroit, Mich., June 8.—Officials of Corrigan, McKinney & Co., operators of the Colby and Yale iron mines, arrived in the town of Bessemer late Sunday, and after several hours' consultation with the local officials, orders were issued to close down the mines for the remainder of the season, with the exception of such mining as is absolutely necessary to protect the mines. Ore on stock piles will be shipped. About 400 men have been thrown out of work, and business is paralyzed in the little village, which is practically supported by the miners. Officials of the company state that the reason for stopping operation is that the assessment for taxation has been increased about 300 per cent, to about 50 cents per ton yer year. As this assessment includes the ore on the stock piles, it would in time cover the entire valuation of the ore. Hence, shipping from stock piles becomes necessary.

SITUATION ON THE LAKES.

Fair Ore Movement in Spite of the Strike—Disturbances Decreasing.

Notwithstanding labor troubles, a considerable volume of freight is moving on the lakes. Ore shipments during May were 3,253,275 tons as against 285,315 tons during May, 1908. Shipments to June 1, 1909, aggregate 3,309,068 tons as against 285,315 tons to June 1, 1908. The increase, therefore, over 1908 shipments to June 1 is 3,022,753 tons. It should be stated, however, that vessel owners were in agreement in 1908 not to open navigation until June 15, which accounts for the poor showing for that year in this statement. To get a real gage on the situation, one must take the 1907 figures when 6,252,261 tons were moved to June 1. The normal reduction in this year's movement is therefore 2,943,193 tons. Following is the tabulated statement of the ore movement to June 1 of the present year with corresponding data for two preceding years:

IRON ORE SHIPMENTS.

Port.	May, 1907.	May, 1908.	May, 1909.
Escanaba	722,516	16,245	337,734
Marquette	366,826	.....	133,097
Ashland	479,924	21,128	232,184
Superior	994,504	132,818	608,515
Duluth	1,835,921	86,691	1,215,925
Two Harbors	1,221,594	28,433	725,820
	5,621,285	285,315	3,253,275
1909 Increase			2,967,960

Port.	To June 1, 1907.	To June 1, 1908.	To June 1, 1909.
Escanaba	1,014,339	16,245	384,856
Marquette	376,873	.....	133,097
Ashland	495,194	21,128	240,855
Superior	1,101,183	132,818	608,515
Duluth	1,937,830	86,691	1,215,925
Two Harbors	1,326,842	28,433	725,820
	6,252,261	285,315	3,309,068
1909 Increase			3,023,753

Regarding the general movement of lake commerce, 4,963,351 net tons of freight were moved through the canals at Sault Ste. Marie. During April, only 221,611 tons were moved, making the movement to June 1 5,184,962 tons. This is a very respectable movement and reveals with what ease vast quantities of freight may be moved on the lakes. This movement is in itself well up to the maximum movement of a few years back, and yet not more than 50 per cent of the fleet is in commission. The prediction is that about 35,000,000 tons of ore will be moved during the present year. This will be approximately 10,000,000 tons more than last year and within 2,000,000 tons of the 1906 movement. Such movement will give the lake fleet reasonable employment after July 1.

These figures show conclusively that notwithstanding labor difficulties the vessels are able to care for the trade. The Lake Carriers' Association reports that 263 of its vessels are in operation. It has an enrollment of 620 vessels, of which 90 are tugs, so that practically one-half of its bulk tonnage is now moving. Additional vessels are steadily going into commission and the indications are that the labor leaders are with difficulty holding their men in line. The center of interest during the week has been in Marine City, where a number of engineers live. The report was current during the early part of the week that a number of them were going to their boats. Some of them have gone, but not as many as reported. There is no question that the engineers individually would prefer to be at work. Disturbances on the docks are growing less. The longshoremen are taking a referendum vote, which may naturally be supposed to be in favor of the striking element, but the dock managers declare that the outcome cannot seriously cripple the leading unloading plants. It may somewhat delay the unloading of ore, but it cannot stop it.

The coal trade is quite active and there is better demand for small carriers to Lake Michigan ports.

The bulk freighter Isaac M. Scott building for the Virginia Steamship Co. will be launched at the Lorain yard of the American Ship Building Co. on Saturday next. This steamer is 524 feet over all, 54 feet beam and 30 feet deep, and will be operated by M. A. Hanna & Co.

The steamer W. E. Corey of the Pittsburg Steamship Co., took on 10,234 tons of ore at Ashland, June 8, in 63 minutes actual loading time. It was just one hour and 23 minutes from the time she made fast at the dock until she sailed. That is probably the best time ever made in handling a cargo of that size.

JULIAN KENNEDY TO YOUNG ENGINEERS.

Julian Kennedy, of Pittsburg, delivered the address at the 37th annual commencement of the Stevens Institute of Technology, at Hoboken, N. J., June 3. The honorary degree of Doctor of Engineering was conferred upon Mr. Kennedy by the institute. In his address Mr. Kennedy told the graduating class that it was much easier to find among the technical graduates good designers of machinery or competent mathematicians than a man who could write a sound contract or even a good business letter. They would find, he said, that the non-technical course in the curriculum would grow in value to them as they got farther away from commencement.

NEW OFFICERS

Chosen by Pittsburg Foundrymen's Association.

A year of progress and success was formally brought to a close by the Pittsburg Foundrymen's Association at its annual meeting held at the Fort Pitt hotel in that city Monday evening, June 7. A new set of officers was elected and inducted into office at this time. The new administration will consist of the following: President, Jos. T. Speer, Pittsburg Valve, Foundry & Construction Co.; vice president, J. S. Seaman, Seaman-Sleeth Co.; treasurer, John McLaren, the Phillips & McLaren Co.; secretary, F. H. Zimmers, Union Foundry & Machine Co.; executive committee, W. H. McFadden, Mackintosh, Hemphill & Co.; C. H. Gale, Pennsylvania Malleable Co.; W. A. Bole, Trafford City Foundries; O. W. Mason, Midland Steel Co.; W. J. Brant, the Millers Product Co.

The report of Treasurer McLaren showed the tidy balance of $461.34 in the treasury while Secretary Zimmers reported an increase of membership to the present total of 107. The committee on the installation of a permanent exhibit of foundry appliances at Pittsburg made a favorable report upon the matter and advised of its having secured the co-operation of numerous manufacturers in this plan. Prof. Conley of the Carnegie Technical Schools extended the use of floor space at that institution for this purpose. A resolution thanking the Carnegie Technical Schools for their assistance and authorizing the committee to proceed with the installation of the exhibit, prevailed.

Following the business session, reminiscences of the Cincinnati convention were given by J. S. Seaman, Jos. T. Spear, T. E. Field, W. H. McFadden, C. H. Gale, W. B. Robinson, F. H. Zimmers and William Yeagle, the speakers being introduced by B. D. Fuller. Prof. Conley and H. D. Lapp, of Austria, Hungary, who has been studying foundry practice in this country, also spoke.

President Spear announced that the present program committee, consisting of H. E. Field, E. D. Frohman and W. B. Robinson, would be continued. The next meeting of the Pittsburg association will be held in September.

The American Vanadium Co., of Pittsburg, will have an elaborate display at the annual convention of the Master Mechanics and Master Car Builders on Young's Pier at Atlantic City, N. J., June 16 to 23. Space 211 has been allotted to the Pittsburg concern for its exhibit including all types of vanadium steel, cast iron, cast steel, bronze and brasses, illustrating the practical application of vanadium products in railroad, machinery, automobile, etc., construction. The company will be represented by the following officials: Joseph M. Flannery, general manager; J. Kent Smith, chief metallurgist; G. L. Norris, engineer of tests; John A. Drain, steel expert; C. L. Hastings, sales department and W. J. Bird, assistant to general manager.

LOW PRICED BASIC

Has Disappeared—Open-Hearth Billets in Demand—Union Calls Meeting.

(Special Telegram.)

Pittsburg, June 9.—A steel company in this district has been buying considerable basic in different lots for last half shipment, and is reported to have closed for upwards of 10,000 tons. Considerable of this business was taken at prices under the quoted market, and as a result of this low priced tonnage having been absorbed, the market has stiffened so that $14.75 valley now appears to be the minimum. Another steel company is out for 1,000 tons of basic, and in foundry iron, sales of 2,000 and 500 tons of No. 2 for third quarter have just been made. The market runs from $14.75 to $15 valley. Another local melter is inquiring for 3,000 tons of No. 2 for last half. A sale of 800 tons of southern No. 2 in northern Ohio was made at $11.50. Late sales have caused a revision of the May Bessemer average, and the current figure is now announced as $14.57¼ valley, or $15.47¼ Pittsburg.

Open-hearth billets continue in demand, and sales have been made considerably in excess of the $23 nominal quotation.

The executive committee of the Amalgamated Association has called a delegate meeting of the sheet and tin plate division to be held in Pittsburg next Monday to determine the union stand on the open shop policy of the American Sheet & Tin Plate Co.

Joseph E. Thropp is preparing to remodel Earlston, Pa., No. 1 stack and the improvements at the Saxton, Pa., furnace are still being made.

The stack of the Dayton Coal & Iron Co., Dayton, Pa., was banked four days of May for slight repairs.

SHIP BUILDING

For Ocean Service Shows Decided Improvement—Contracts Awarded.

Ship building conditions on the coast, especially in relation to construction for the Pacific coast, appear to be improving rapidly. The American-Hawaiian Steamship Co. has just awarded contracts for three new steamers to cost approximately $1,750,000, to the Maryland Steel Co. for its service between New York, San Francisco and Hawaii. The Ocean Steamship Co. (Savannah Line) has also closed contracts with the Newport News Ship Building & Dry Dock Co. for two new coastwise liners to cost approximately $500,000 each. The steamers are to be 379 feet long and 49 feet 6 inches beam with accommodations for 235 passengers and 3,500 tons of freight. The Newport News company is also building two steamers for the San Francisco & Portland Steamship Co. to be 380 feet over all, 47 feet beam and 34 feet depth. The same concern has also received an order to build an oil-burning tank steamer for the Associated Oil Co. of San Francisco. This tank steamer will be 390 feet long, 49 feet beam and 30 feet deep. The Standard Oil Co. has just awarded a contract to the New York Ship Building Co. for two barges for service in New York harbor. Bids will be opened in a day or two for a new steamer for the Hartford & New York Steamship Co. to replace the Horatio Hall. The Southern Pacific Steamship Co. (Morgan Line) is also figuring on adding three new steamers to its fleet. It is reported also that the Pacific Mail Steamship Co. may add four new steamers to its Pacific coast fleet, but no definite information has been received on this score. The navy department has just distributed contracts among the coast ship builders for five torpedo boats as follows: Bath Iron Works, one at $659,000; New York Ship Building Co., one at $648,000; Wm. Cramp & Sons, one at $637,000; Newport News Ship Building & Dry Dock Co., one at $629,000; and the Fore River Ship Building Co., one at $644,000. The quartermaster general of the United States army will open bids on June 15 for four single screw steel steamers to be 120 feet long, 24 feet beam and 12½ feet deep for harbor service.

The stack of the Edgewater Iron Co., Lebanon, Pa., was banked all month.

SHARP INCREASE IN PRODUCTION

A decided increase of the pig iron production in May is shown by our blast furnace figures just compiled. The total production of coke and anthracite pig iron in May was 1,866,757 tons, compared with a production of 1,731,406 tons in April, an increase of 135,351 tons over April, which was a month with one short day, and an increase over March, which had the same number of days as May, of 44,733 tons. The production in May was divided as follows: Merchant iron, 606,449 tons; non-merchant or steel-making iron, 1,236,695 tons; spiegel and ferro, 23,613 tons. The production of merchant iron showed a decrease over the April production of 7,575 tons; the non-merchant or steel making iron production for May, on the other hand, showed an increase of 143,174 tons. The production by months is shown in the following table:

MONTHLY PRODUCTION.

	1909.	1908.	1907.
January	1,787,473	1,043,374	2,194,801
February	1,682,470	1,086,809	2,047,036
March	1,822,024	1,229,856	2,216,709
April	1,731,406	1,155,122	2,226,708
May	1,866,757	1,168,002	2,291,030
June		1,106,300	2,237,420
July		1,228,604	2,253,243
August		1,366,019	2,243,656
September		1,416,252	2,174,148
October		1,573,824	2,359,690
November		1,582,314	1,820,558
December		1,723,664	1,234,733
Total	8,890,130	15,680,140	25,299,732

The average daily production for May surpassed that of any month for this year or for the year 1908, even exceeding the daily average for November, 1907, when curtailment due to the financial panic first became apparent. The daily average for May showed a gain over that for April of 4 per cent. The percentage of the total possible output for May was 56.6, which compares with January, which was 56.3; February, 57.3; March, 56.9, and April, 54.8. The following table shows the daily production of the various months of last year compared with those of the present year:

AVERAGE DAILY PRODUCTION.

	1909.	1908.
January	57,654	34,316
February	60,051	37,476
March	58,775	39,672
April	57,788	38,504
May	60,218	37,677
June	.....	36,876
July	.....	39,632
August	.....	44,065
September	.....	47,208
October	.....	50,764
November	.....	52,744
December	.....	55,602

The average daily furnace capacity in blast the last day of May was 61,336.4, compared with 57,859.2 in April. This was a gain for May of 3,477.2 tons. A total of 26 stacks was blown in during the month, and 14 blown out, making a gain of 12 more furnaces in active operation in May than in April. Of these stacks, 22 steel making stacks were blown in and 5 were blown out; 4 merchant stacks were blown in and 9 were blown out during the month. All the states and groups of states showed increases in their production for May except Alabama, Virginia, New Jersey and the Tennessee group. The figures all show that the curtailment of production by the merchant furnaces continues, while the steel making furnaces have suddenly increased their production to a degree that while apparent in May will be more marked in June.

MAY FURNACE REPORT.

STATES	NO. OF STACKS.	NO. IN BLAST ON LAST DAY OF MONTH. MAY	NO. IN BLAST ON LAST DAY OF MONTH. APRIL	PERCENTAGE OF TOTAL POSSIBLE OUTPUT MADE.	AV. DAILY CAPACITY IN BLAST LAST DAY OF MONTH.	ACTUAL TONNAGE MADE. MERCHANT.	ACTUAL TONNAGE MADE. NON-MERCHANT.	TOTALS. MAY.	TOTALS. APRIL.
Pennsylvania	155	99	93	63.6	26,967.6	180,085	639,415	819,500	728,336
Ohio	66	46	41	63.5	13,721.8	119,373	272,188	391,561	372,624
Alabama	46	19	22	43.4	3,478.9	113,524	———	113,524	139,493
Virginia	24	9	11	43.0	892.8	31,758	———	31,758	34,018
New York	25	13	12	52.0	3,529.5	57,627	51,795	109,422	88,450
New Jersey	9	3	3	33.3	630.6	19,555	———	19,555	19,798
Illinois	25	18	18	72.0	6,602.4	17,028	180,197	197,225	170,128
Tennessee, West Virginia, Kentucky	18	7	7	36.9	1,333.2	27,511	8,920	36,431	36,778
	4	3	1						
	7	2	2						
Maryland, Wisconsin, Colorado, Indiana	4	2	2	61.2	3,970.4	23,590	84,180	107,770	100,051
	6	5	4						
	6	3	2						
	4	4	3						
Georgia, Texas, Minnesota, Michigan, Missouri	2	0	0	35.5	496.8	16,398	———	16,398	15,718
	3	0	0						
	1	1	0						
	2	1	2						
	1	1	1						
Spiegel—All states								13,617	9,788
Ferro—All states								9,996	16,219
Total	407	236	224	56.6	61,336.4	606,449	1,236,695	1,866,757	1,731,406

BLAST FURNACE NOTES.

The Hamilton Iron & Steel Co. blew out its Hamilton, O., stack May 9.

The Central Iron & Coal Co. blew out its Holt, Ala., stack May 17 for relining.

The Woodstock Iron & Steel Corporation blew out its Woodstock, Ala., furnace for relining May 31.

The Tennessee Coal, Iron & Railroad Co. now has four stacks blowing at Bessemer; Nos. 1 and 2 being blown in May 6. The best daily record for the four furnaces in the month was made on May 23, 767 tons. This is the best daily tonnage made with this number of furnaces in blast in the Bessemer division of the company.

CONVENTION OF SOCIETY FOR PROMOTION OF ENGINEERING EDUCATION.

The 17th annual convention of the Society for the Promotion of Engineering Education will be held in Earl hall, Columbia University, New York City, and Pratt Institute, Brooklyn, N. Y., June 24 to 26, inclusive.

Columbia University has generously offered its dormitories free of expense for the use of members and their families. It also offers the privilege of its Faculty Club.

Some of the important topics on the program of the meeting are as follows: Presidential address, report of the joint committee on engineering education with discussion, report of the library committee, mathematical symposium; report of the committee on degrees for engineering students, report of the committee on requirements for graduation, the five-year course, the summer school, the extension work of the University of Wisconsin, careers of graduates of the University of Michigan, efficiency in engineering education.

The Wheeling Iron & Steel Co. lighted its Martins Ferry, O., stack June 4.

The Illinois Steel Co. lighted its No. 3 Milwaukee stack May 10.

PERSONALS.

J. M. Tuthill, of Baldwin, Tuthill & Bolton, Grand Rapids, will sail the end of this month for a three-months' vacation in Europe.

E. W. Oglebay, of Oglebay, Norton & Co., Cleveland, has returned from a trip to Europe.

Henry C. Frick was a returning passenger on the Mauretania on its recent record-breaking trip. He has spent some months abroad.

George M. Armstrong, formerly with the Chicago Steel Foundry, Chicago, has been appointed sales manager for the Oostburg Steel Foundry, Oostburg, Wis.

T. Z. Salt has been appointed superintendent of the coke plant of the Illinois Steel Co. at Joliet, succeeding G. C. Lowell. Mr. Salt was formerly of Sharon, Pa.

J. P. Morgan Jr. has been elected both a director and a member of the finance committee of the United States Steel Corporation, to succeed H. H. Rogers, deceased.

Joseph McDonald, general superintendent of the Carnegie Steel Co.'s mills and blast furnaces at Youngstown, O., has returned from a stay of some weeks in England and the continent.

J. Bertram Lippincott, vice-president of the Wharton Steel Co., has been elected a director of the Farmers & Mechanics National Bank, Philadelphia, to succeed Geo. C. Thomas.

Allen W. Smith, superintendent of the Girard, O., mill of the A. M. Byers Co., has resigned. He had been manager of the Clearfield, Pa., plant of the same company before going to Girard.

E. E. Henner, general engineer of the Oliver Iron Mining Co. for the Hibbing district, has been promoted to chief engineer in the operating department of the Oliver company, with headquarters in the company's general offices at Duluth.

Edmund L. French has been appointed manager of the Sanderson Bros. Steel Co., the Syracuse, N. Y., branch of the Crucible Steel Co. of America. Since June, 1908, Mr. French had been assistant manager, having been employed at the plant since 1897.

Carl M. May, formerly assistant engineer in the fuel testing branch of the United States Geological Survey, has been appointed assistant mining engineer on the staff of the fuel engineering department of the Arthur D. Little laboratory of engineering and chemistry, Boston.

Herman D. Lapp, of Eisenwarenfabriks Actiengesellschaft, Sopron, Hungary, is making a tour of American foundries, studying modern practice in this country. Mr. Lapp attended the convention of the American Foundrymen's Association at Cincinnati.

Judge E. H. Gary will give a dinner to Sir Robert Hadfield, ex-president of the Iron and Steel Institute, and Director Von Bodenhausen, of the Krupp Works, at the Waldorf Astoria, New York, Saturday evening, June 19. The event will be entirely social.

Joseph G. Butler Jr., chairman of the Bessemer Pig Iron Association, has been elected president of the Chamber of Commerce of Youngstown, O. Thomas McDonald, general superintendent of the Carnegie Steel Co.'s mills in the Mahoning valley, has been elected second vice president

J. G. Rittenhouse Jr., selling agent of the Cambria Steel Co. at Philadelphia, has resigned after nearly 30 years' service. Fred W. Coxe, who has been connected with the Cambria company since 1879, succeeded Mr. Rittenhouse on June 1 as Philadelphia sales agent. M. C. Edwards has been appointed assistant sales agent for merchant steels in the Philadelphia territory.

R. W. Anderson, formerly assistant superintendent of the open-hearth furnaces at the South Works of the Illinois Steel Co., resigned June 1 to accept the position as superintendent of the open-hearth plant of the Lackawanna Steel Co., at Buffalo. On Saturday night, before leaving Chicago, he was tendered a banquet, at which he was presented a silver service by his friends and business associates.

OBITUARIES.

D. W. Marmon, president of the Nordyke & Marmon Co., manufacturer of flour milling machinery and automobiles, died at his home in Indianapolis recently after a year's illness. He had resided in Indianapolis for more than 30 years when the old firm of E. & A. Nordyke was reorganized under the present name and moved from Richmond to Indianapolis.

John R. Couch, manager of the Bishop & Babcock Co., died May 27 at his home in New York City, following a stroke of apoplexy, aged 57. He was born in Carrollton, O., engaged in the hardware business in Canton, and after several years transferred his interest to Cleveland. In 1898 he went to New York in the employ of the Bishop & Babcock Co. He was president of the Manufacturers' & Dealers' League.

Henry C. Challingsworth, foundry superintendent of the A. E. Shorthill Co., Marshalltown, Ia., died in that city May 12, aged 45. He was formerly a resident of Mount Vernon, O., where for several years he was foreman of the foundry at the C. & G. Cooper's plant, and later manager of the Challingsworth Foundry & Machine Co. For several years thereafter he was foundry superintendent of the Lima Locomotive Co.'s plant, and only a short time before his death became associated with the Shorthill company. His father, William Challingsworth, was foreman of the iron, brass and steel foundry of the Phoenix Iron Co., Phoenixville, Pa., for over a quarter of a century.

Edward D. Jones, founder of the Detroit Ship Building Co., died June 8 in Detroit, aged 90 years. He was born in Wales, and when a young man became a laborer in the ship yards at Birmingham, England. He came to New York in 1844 and to Detroit in 1852, soon afterward becoming connected with Jackson, Wiley & Co. and the Detroit Locomotive works. With William Cowle and John Donaldson, he organized the Detroit Dry Dock & Engineering Works, which was disposed of to the McMillan interests 20 years ago, since which time Mr. Jones has led a comparatively retired life. He is survived by a widow, a daughter and one son, Lewis H. Jones, president and general manager of the Detroit Copper & Brass Rolling Mills.

Henry A. Lanman, president of the E. B. Lanman Mfg. Co., died June 5 at his home in Columbus, aged 64 years. He was born in Norwich, Conn., and at the age of 21 became associated at Columbus, O., with James Ohlen in the manufacture of saws. In 1870 he became treasurer of the Columbus Rolling Mill Co., being associated with Gen. Samuel Thomas in building a mill for rolling rails. About the same time, he became principal owner of the Columbus Bolt Works, and remained at the head of the company until his death. In 1895 Mr. Lanman was elected president of the Columbus Machine Co. He was a director in several banks, the Columbus Stove Co., and was active in various business enterprises.

A Roll Contract.—The Seaman-Sleeth Co., Pittsburg, roll manufacturer, has taken the order for a full line of rolls for a 28-inch structural mill for Compania Sundidora de Sierrio y Acero of Monterey, Mexico. At the present time, the company is operating a rail mill, and it is proposed to arrange this equipment so that structural material may also be rolled.

PROSPERITY HELPED BY AUTOMOBILE BUILDERS

ADDITIONAL SHOPS AND EQUIPMENT ARE ENGAGING ATTENTION

Prospects Are Excellent for Steady Continuance of Busy Season—Without Exception Auto Manufacturers Look for Unexampled Business in 1910

That the automobile manufacturers are working their plants to capacity, many of them undertaking much new building and purchasing additional machinery equipment in the endeavor to keep up with the extraordinary demand for automobiles, was pointed out in THE IRON TRADE REVIEW last week in a series of letters from the manufacturers themselves. Herewith are presented a number of additional letters written in answer to the inquiry addressed to the leading automobile builders throughout the country by THE IRON TRADE REVIEW in the endeavor to learn something accurately concerning the real status of the automobile business at this time:

The Carter Car Co.

The Carter Car Co., Pontiac, Mich., recently purchased the plant which it is now occupying and which provides room for increasing its business nearly 40 per cent, and while it does not expect to make any further extensions in the immediate future, yet it is constantly adding all kinds of machine tools and appliances, and increasing its business rapidly. Further, the company says:

"We are constantly adding to our equipment all kinds of machine tools and appliances, and increasing our business rapidly. At present we have orders for cars far in excess of our facilities to manufacture. The prospects were never better and from all indications, next season will be better than the present."

The Consolidated Mfg. Co.

The Consolidated Mfg. Co., Toledo, O., manufacturer of the Yale-California motor cycles, Yale & Snell bicycles, "Hussey" bars, drop forgings, oil well jacks, etc., advises that it has made no additions to its plant and does not contemplate making any in the near future, and also that it is not in the market for any new equipment, as it has converted some of its special machines into motorcycle equipment. In regard to the business outlook, the company says:

"Our business as a whole is very satisfactory and while we could do more, feel that we have as much as the other fellow and are very happy to state are getting better prices. The business outlook for the remainder of the year is very good."

The Anderson Carriage Co.

The Anderson Carriage Co., Detroit, maker of the Detroit electric carriage, says: "While we have not recently made any important changes in the construction of our plant or the machinery involved therein, yet we would say that business with us at the present time is beyond our most sanguine expectations."

Model Automobile Co.

The Model Automobile Co., Peru, Ind., builder of "Great Western," is planning a very much larger output for the coming season, not less than 1,000 cars. It has placed all its orders for equipment and does not expect to be in the market for further additions for some time to come. It is in a position to turn out from 1,500 to 2,000 cars in the factory which it now occupies.

Charles E. Duryea.

Charles E. Duryea, Reading, Pa., buggy-autos, motors, etc., says that while his machines are largely built by contract yet he knows that some of the shops which manufacture for him have added equipment. As to prospects he says:

"Business is booming ahead of output and the prospect is that the demand for a simple motor buggy will continue to increase. This looks particularly true in the South and in rough parts of the country, where the small wheeled auto has not appealed to the people. It is also true in the older auto states like New York and Massachusetts where the people have large machines which they wish to save from unimportant short errands."

The Babcock Electric Carriage Co.

The Babcock Electric Carrige Co., Buffalo, recently added a building to its plant 50 x 90 feet and another 40 x 100 feet is in course of erection, both buildings adding 15,000 square feet floor space. Further it advises:

"We have been manufacturing electric automobiles for the past ten years, and are the oldest electric manufacturers in this country under the one management. Our business was never as good as it is at the present time, and we have orders already placed for our entire year's output."

The Thomas Motor Co.

The Thomas Motor Co., Buffalo, has just made a small addition to its plating and polishing department and has added to its equipment in the ordinary course of business. Further it says:

"Prospects are very good indeed for the remainder of the year. We anticipate the biggest season we ever had. All 1909 cars are sold and 1910 are well along in machine work."

Alden Sampson Mfg. Co.

The Alden Sampson Mfg. Co., manufacturer of motor trucks and gas-electric road trains, with a factory at Pittsfield, Mass., advises that while it has not made any additions to its plant recently, it has added equipment from Manning, Maxwell & Moore, the Prentiss Tool & Supply Co. and the Crocker-Wheeler Co., which will be sufficient for its present needs. The company says:

"Business is being held up awaiting the tariff decision. We believe it will be good as soon as congress has acted and adjourned."

The Velie Motor Vehicle Co., Inc.

The Velie Motor Vehicle Co., Inc., Moline, Ill., is increasing the size of its plant 150 per cent, and while it has not as yet installed new equipment for the manufacture of automobiles, it will do so in the near future. The company advises further:

"Business at the present time is excellent and prospects for the remainder of the present year are all that can be desired."

The Rider-Lewis Motor Car Co., of Anderson, Inc.

The Rider-Lewis Motor Car Co., of Anderson Inc., Muncie, Ind., has nearly completed its new Anderson plant, the main building of which is 423 x 60 feet, with wings 140 x 32 feet. This will give largely increased manufacturing facilities, and the company will be in the market for extra machine tools about July 1. Speaking of business prospects, the company says:

"The prospects for Rider-Lewis cars

are exceedingly bright and many large contracts have already been closed."

Thomas B. Jeffery & Co.

Thomas B. Jeffery & Co., Kenosha, Wis., manufacturers of the Rambler automobile, are adding about 80,000 feet of floor space to their plant, and have installed equipment recently purchased from the following companies: The Landis Tool Co., the Ferracute Tool Co., Jones & Lamson, the Brown & Sharpe Mfg. Co., and others. The Jeffery company is still in the market for wood and iron working machinery for automobiles, and says:

"We find business quite satisfactory and the prospects for the remainder of the year are quite good."

Peerless Motor Car Co.

The Peerless Motor Car Co., Cleveland, is erecting two three-story factory buildings and a four-story office building. The frame work for one of the factory buildings is entirely up and the office building is up to the ground level. When completed the factory will have over eight and one-half acres of floor space.

Hupp Motor Car Co.

The Hupp Motor Car Co., Detroit, is just erecting a new factory which it expects to get into about Aug. 1. This will be a two-story building, 50 x 130 feet, with two wings in the form of a U, each 50 x 350 feet. It will not install any machinery for manufacturing but will do an exclusive assembling business at this plant. Further it says:

"Business is very good. We have sold our 1909 product and will deliver same by August 1, when we shall immediately begin puting out our 1910 product."

The Autocar Co.

The Autocar Co., motor vehicles, Ardmore, Pa., has not made any additions to its plant lately nor does it expect to do so in the near future. Speaking of business prospects, it says:

"Business is good and we expect the next two years to be the biggest in the history of this industry."

The Gaeth Automobile Co.

The Gaeth Automobile Co., Cleveland, has recently increased the size of its repair shop, doubled the size of its assembling department, increased the size of the blacksmith shop and added a new paint and finishing department. It has also recently installed a No. 2 Brown & Sharpe milling machine, one large and one small Arbor press, all furnished by the Strong, Carlisle & Hammond Co., and may possibly be in the market in the near future for a gear cutting machine. Further it advises:

"Business at present we have found to be rather steady and we expect this condition to hold for the remainder of the present year or there may of course be a small increase in general business activity."

Moon Motor Car Co.

The Moon Motor Car Co., St. Louis, has recently doubled the size of its plant and has installed additional equipment for manufacturing. It has found business "very good" and like prospects for the remainder of the year.

Atlas Motor Car Co.

The Atlas Motor Car Co., Springfield, Mass., has added 20,000 square feet of floor space in additions during the year, has added some machinery equipment additional and shall order more during the remainder of this year. Further advising, it says:

"Business at present crowds us to utmost capacity and we see no immediate prospect of let up."

The Acme Motor Car Co.

The Acme Motor Car Co., Reading, Pa., has made no additions to its plant this year nor shall it do so, nor has it added any new equipment. The company possesses a large and well equipped plant with a moderate output and is aiming to bring its output up to the capacity of the plant. As to prospects it says:

"Business at present is excellent. Prospects for the balance of the year are most encouraging."

Victor Automobile Mfg. Co., Inc.

The Victor Automobile Mfg. Co., Inc., St. Louis, manufacturer of Victor hand-forged automobiles, advises that it is about to build a new factory and expects to move into it in about four or five months. While it does not anticipate any large increase in its machinery equipment yet it may add to it at that time. Further advising it says:

"Business now is very good. Prospects for the remainder of the year seem good."

The A. B. C. Motor Vehicle Mfg. Co., Inc.

The A. B. C. Motor Vehicle Mfg. Co., 2315-31 Morgan street, St. Louis, Mo., advises that since the first of the year it has added extensively to its equipment. It has put in several automatic machines, added to its lathe, drill press and milling equipment. It has also installed some special machines for particular work peculiar to its own cars and will doubtless add still more in the very near future.

"The demand for moderate priced automobiles such as we are building," the company states, "has been remarkable, and although we increased our capacity 100 per cent at the beginning of the season of 1909, we are preparing to make a similar increase for the season of 1910. We are running a day and night shift fu'l force, 20 hours a day."

The Sayers & Scovill Co.

The Sayers & Scovill Co., Cincinnati, builders of air-cooled commercial auto trucks, has made an addition to its plant for the purpose of building three-ton automobile trucks. It buys the engines and transmission gear and aims to manufacture the remainder of the machinery. Respecting the business conditions now obtaining and the future it says, "Prospects are fair."

Smith Automobile Co.

Smith Automobile Co., Topeka, Kas., while not having made any great additions to its plant during the year yet it is steadily improving it and will continue to do so but without any large increase in the near future. Various pieces of additional equipment have been installed in the year, purchased from various machine tool builders, but its demands for the future will only be limited. Further it says:

"Business at the present time is very rushing, and the company is sold as far ahead, if not farther, than it ever was at any time in previous years, and the business outlook for the future is of the best."

Harley-Davidson Motor Co.

Harley-Davidson Motor Co., Milwaukee, motor cycles, is having plans drawn for an addition to its plant, 60 x 150 feet, three stories, of concrete and brick, absolutely fireproof. It expects to purchase a complete power plant, a number of machines, electro plating outfit, case-hardening ovens, and possibly some additional machine tools such as automatic screw machines, etc. As to business conditions, it advises:

"Business at the present time is very good, and while we cannot say what the prospects for the remainder of the year are, will say that our 1909 output is practically contracted for now."

James D. Flynn, of Ardmore, Okla., has made a contract with the town of Sapulpa, Okla., to remove his iron foundry to the latter town.

AMONG MACHINERY MAKERS.

CINCINNATI.

Improvement Continues, But With Some Irregularity.

Office of THE IRON TRADE REVIEW, First National Bank Bldg., June 8.

While there are evidences of a gradual improvement in the machinery and tool trade in this center, the increase in orders is more or less spasmodic and it is difficult to note a change in conditions from week to week. For this reason, monthly comparisons more nearly reflect the changes in conditions. The first week in June appears to have been as fruitful in the way of orders as the preceding weeks during May, and there is reason to hope that by the close of the month June may be as good or better than May. Some good lathe orders have been received during the week, one large concern having received orders for 16 lathes in one mail. Builders of special machinery are keeping fairly busy and manufacturers of pulleys report business good. Foundries are running at about the same rate as in the past few weeks and are mainly reporting about three heats per week. The general tone of expressions from heads of machine tool concerns is cheerful and the belief that the worst has passed and that a gradual improvement is taking place is given in response to inquiries regarding business conditions.

The Lunkenheimer Co. was awarded the contract for $50,000 worth of valves by the Isthmian commission during the past week. The commission has purchased considerable material of late, but this is the largest contract given to any local manufacturer. A large part of the specifications calls for immediate shipment.

A meeting of the contributors to the local fund for the entertainment of the American Foundrymen's convention was held this week in the office of Matthew Addy & Co. A surplus of $500 was found to be on hand and it was decided to turn this in to the treasury of the Cincinnati Convention League, partially to reimburse that organization for the expense incurred in arranging for the convention.

The Samuel C. Tatum Co. has issued invitations for the celebration by the company of its fiftieth anniversary on Thursday afternoon, June 10. This is to be the formal opening of the company's new plant at Colerain avenue and Monmouth avenue. The company is still operating its foundry at its old plant and the new factory is devoted almost exclusively to the manufacture of paper punching machines. The new plant is one of the handsomest structures in the machine tool district.

The Monarch Tool Co., which makes a specialty of dies and metal specialties, was incorporated during the past week with a capital stock of $10,000.

The Courier Car Co., of this city, has been incorporated with a capital of $200,000 by Charles G. Stoddard, John W. Stoddard, H. J. Edwards, John F. Campbell and H. W. Hayden, all of whom are interested in the Dayton Motor Car Co. The company intends to take over the building just vacated by the Kinsey Mfg. Co., which is being removed to Toledo, to be operated in conjunction with the Overland Auto Co.

CLEVELAND.

Marked Increase in May Sales—Industrial Exposition.

Office of THE IRON TRADE REVIEW, Browning Building, June 8.

The first week in June shows a marked activity among Cleveland machine and machine tool manufacturers. The feeling is prevalent that the backbone of business depression is broken. This optimism is well-founded, apparently, inasmuch as most of the shops are running at capacity, while in several instances night shifts have been instituted.

Local concerns are evincing a marked interest in the Cleveland Industrial Exposition, which opens June 7. Much time has been spent by the leading manufacturers in the preparation of their exhibits. According to reports, several exhibits are absolutely new, not even having been placed on the market as yet.

The Globe Machine & Stamping Co. reports greater sales in the past few months than during the corresponding months in 1906, which was a banner year.

S. M. Chase, secretary and general manager of the Chase Foundry & Mfg Co., of Columbus, O., states that the company's April business showed an increase of 100 per cent, while its May business was 300 per cent over the same months of 1908.

The Variety Iron & Steel Works Co., the Acme Machine Co., the Long Arm System Co., the Ajax Mfg. Co., and others, report a marked increase in business during the past week.

While the Brown Hoisting Machinery Co. is not up to capacity as yet, it is doing considerable crane and trolley construction. Work is being resumed on part of the equipment for the Aliquippa plant of the Jones & Laughlin Steel Co. This was started nearly two years ago, but was dropped temporarily on account of prevailing business conditions.

The Cleveland Machine & Mfg. Co. reports the starting of a night shift this week.

Another firm reporting an advance in sales is the Waterbury-Farrel Foundry & Machine Co. May sales through the Cleveland office were the heaviest in about two years.

INDIANAPOLIS.

Large Building Contracts Let—New Machinery Makers Chartered.

Indianapolis, June 7.—Albert von Spreckleson, an Indianapolis contractor, has been awarded the contract for building the Murat Temple, his bid being $229,000. He has let the subcontracts to local concerns, the Brown-Ketcham Iron Works receiving the contract for the structural steel. The building will be one of the most attractive structures in the city, with an auditorium having a seating capacity of 2,200.

The Brown-Ketcham Iron Works also has the contract for practically all of the steel being used in the erection of a $400,000 locomotive erecting plant being built at West Olney, N. Y., for the New York Central lines by Lynn B. Millikan, a local contractor.

A company for the manufacture of machinery to be used in making paper bottles has been organized and inporated with an authorized capitalization of $1,000,000. It is known as the National Coning Machinery Co. with William A. Scott, Alfred C. Wood and Murat W. Hopkins as the directors. A suitable location for a plant that will employ about 200 men is being sought.

The Van Buren Tool Co. has been organized at Van Buren to establish a foundry and do a general machine shop business. E. L. Coddington, Alonzo Coddington and Albert Coddington have incorporated the concern with an authorized capitalization of $25,000.

Marking and other machinery will be manufactured by the Ream-Diehl Ma-

chinery Co., which has been organized at Peru by Ed B. Ream, Fred S. Ream and George M. Diehl. The company is incorporated at $25,000.

The Crawfordsville Heating Co. will establish a plant at Crawfordsville for supplying the city with light, heat, water and power. Hosea H. Ristine, W. P. Herron, William B. Lynch, James E. Evans, Dumont M. Peck, Rankin C. Walkup and George B. Luckett are the incorporators of the concern, which has $100,000 capital.

MILWAUKEE.

Steady Improvement Apparent Among Shops and Foundries.

Milwaukee, Wis., June 7.—Conditions observed during the first week of June appear to indicate that the present month's business among machinery builders will show an accelerated progression, just as the previous month went to show a larger volume of business than April. There is nothing startling in the improvement, but it is steady and certain, which under the circumstances, seems satisfactory to the trade.

The Power & Mining Machinery Co., Cudahy, Wis., has been awarded the contract for a stone crusher and duplicate parts, of 300 cubic yards capacity an hour, by the Isthmian Canal Commission for use at LaBoca, Panama. The cost is $61,000. This will be one of the largest stone crushers ever built.

The Rathburn-Jones Engine Co., Toledo, O., has installed a gas producer power plant in the Wisconsin Knitting Mills Co.'s factory at Manitowoc, Wis.

Bids for the construction of a bridge over Fox river, at Appleton, Wis., to be 277 feet long and 31 feet wide, have been opened, but the contract has not yet been awarded pending action by the common council on the point of whether concrete or steel construction would be preferable. The Central Bridge Co. of Indianapolis is the lowest bidder for the steel bridge, at $22,540, and the Illinois Bridge Co., Chicago, the lowest bidder for a concrete structure at $25,970.

The Northwestern Steel & Iron Works, Eau Claire, Wis., is enlarging its foundry by the addition of a room of 20 x 100 feet dimensions. The addition is made necessary by the growth of the business in plows, marine engines, cement block machines, etc.

The Malleable Iron Range Co., Beaver Dam, Wis., has awarded the contract for the erection of three new buildings to Daniel Danielson, general contractor, Milwaukee. The buildings will cost $50,000 and will be ready for occupancy about Oct. 1.

The Janesville Machine Co., Janesville, Wis., is building an 80-foot stack of plate construction, 3 feet in diameter, somewhat larger than the present stack, which it will supplement.

The Wisconsin Motor Mfg. Co., North Milwaukee, Wis., has started active operations. The product is a 4-cylinder type gasoline motor for automobiles, with cylinders cast in pairs. The officers report an excellent demand for the motor and the expectation of a large volume of business for 1910 models, although the season is late. Orders for motors for 1911 models are already being figured on.

The Stevens Point Foundry & Machine Co., incorporated with a capital stock of $5,000, will take over the property of the Central City Iron Works of Stevens Point, Wis., owned by R. A. Cook, which were closed some time ago. The company's lease carries with it privilege of purchase. Michael Hawkins and Henry Horn Jr., are expert molders, Edwin Martin, a machinist, and R. A. Overlatz and J. J. Neuberger, the remaining stockholders, are business men of Stevens Point. All will take active parts in the business.

THE BRUCE-MACBETH ENGINE COMPANY.

The Macbeth Iron Co., of Cleveland, engineer, founder and machinist, builder of blowing engines, etc., and the Bruce-Meriam-Abbott Co., also of Cleveland, builder of gas engines, were consolidated on June 1, as briefly noted in these columns last week, the name of the new company being the Bruce-Macbeth Engine Co. Both of the above companies have been long established in Cleveland, and their amalgamation makes one of the largest and strongest companies of its kind. The Macbeth Iron Co. dates from the year 1870, having been known until late years as Macbeth & Co. The Meriam-Abbott Co., predecessor of the Bruce-Meriam-Abbott Co., was organized in 1900, and has been one of the pioneers in the manufacture of the commercial gas engine and its development to the present standard of perfection.

It is the purpose of the Bruce-Macbeth Engine Co. to continue the business of both of the former companies on a much larger scale than before. The manufacture and development of the gas engine will be continued and the former line of work of the Macbeth Iron Co., building of blowing engines and general machine and foundry work, will be conducted as heretofore.

It is the intention of the new company to concentrate the two present plants at the former plant of the Macbeth Iron Co., on Center street N. W., Cleveland. Alterations to the present buildings will be made and several new buildings will be erected to accommodate the enlarged business and the combined equipment of the two companies in one plant will make a very complete and modern shop.

The officers of the company are as follows: President, W. C. Bruce; vice president, C. W. Kelly; secretary and treasurer, C. J. Snow; manager, C. E. Curtiss.

The above, with A. D. Macbeth, J. B. Meriam and F. B. Abbott, constitute the board of directors. Mr. Bruce, president, was formerly president of the Bruce-Meriam-Abbott Co.; Messrs. Kelly, Snow and Curtiss retain the same positions formerly held in the Macbeth Iron Co.

VESSEL MEN AND ORE MINING.

The increased tonnage of ore which consuming interests are carrying in their own boats as the result of the building of new vessels each year is decreasing by just so much the tonnage available to the independent vessel owner who depends for tonnage upon contracts with ore owning interests. One of the largest of the independent vessel interests is the Tomlinson line and the connections of this fleet in the past have been perhaps the best of any in the trade. It is significant, therefore, that an association consisting of G. A. Tomlinson, manager of this line, Thomas F. Cole, formerly president of the Oliver Iron Mining Co. and Jos. B. Cotton, formerly general solicitor of the Oliver Iron Mining Co., is now seeking options to explore and lease ore properties. The Volunteer mine on the Marquette range, the details of the purchase of which were published about a year ago, is controlled by this interest and preparations have been made for the resumption of work at this property. An option has also been taken on a deposit of two or three million tons of non-Bessemer ore near Virginia on the Mesabi range.

The United States Steel Corporation has combined the Elgin, Joliet & Eastern and the Chicago, Lake Shore & Eastern railroads, the combination being known as the E. J. & E. railroad; this was done simply to facilitate the management of the two roads, as both are owned by the corporation.

OPEN SHOP DECLARATION

By American Sheet & Tin Plate Co. Prepares for Wage Readjustment.

The action of the American Sheet & Tin Plate Co. in declaring for the open shop at its different plants effective July 1, if maintained, will result in the complete abandonment of union agreements among the manufacturing subsidiaries of the United States Steel Corporation. The American Sheet & Tin Plate Co. is the last to adopt this policy, the other connected manufacturing companies of the Corporation having established open plants at various times in the past. Previous to the action just taken, the last contention between the mills and the men was the strike at the upper and lower mills of the Carnegie Steel Co. in Youngstown in 1904 when the company succeeded in overthrowing the steel bar scale with the Amalgamated Association of Iron, Steel and Tin Workers at its Youngstown, Greenville, Girard and Warren plants.

A new wage scale for the sheet and tin plate mills which shows some reduction from the union schedules has been announced by the American Sheet & Tin Plate Co. In the union tin mills in the past, the wage scale has been on a basis of from 2 to 2½ per cent higher than in the non-union plants, and this difference has generally been equalized in the "open" scale. The 3 per cent rebate clause by which the workmen submitted to a lower pay on re-export tin plate in order to compete with foreign makers has been abandoned. No change has been announced in the tin house scale.

The comparison of the present scale for the hot mills in tin plate plants on the base size of 30 gage with the new scale, is as follows:

WAGE SCALES COMPARED.

	Old Scale.	New Scale.
Roller	$3.22	$3.14
Doubler	2.12	2.07
Heater	2.20	2.02
Catcher	1.10	1.07
Screw Boy	.72	.70
Shearman	.40	.39

What effect the declaration of the open shop by the American Sheet & Tin Plate Co. will have upon the union sheet and tin plate mills of the independent companies is a matter of conjecture. As a general rule in the past, the independent companies have signed the scale agreed to in conference between the representatives of the American Sheet & Tin Plate Co. and the Amalgamated Association. The present agreement expires July 1.

Tin Mills.

The union tin plants of the American Sheet & Tin Plate Co. and of the independents at present with the number of hot mills, are as follows:

AMERICAN.

American, Elwood, Ind.	28
Anderson, Anderson, Ind.	7
Humbert, Connellsville, Pa.	6
La Belle, Wheeling, W. Va.	10
Laughlin, Martins Ferry, O.	23
Greer, New Castle, Pa.	20
Sharon, Sharon, Pa.	20
Shenango, New Castle, Pa.	30
Morewood, Gas City, Ind.	8
Total mills	142

INDEPENDENTS.

Follansbee Bros. Co., Follansbee, W. Va.	6
Whittaker-Glessner Co., Wheeling, W. Va.	5
Empire Iron & Steel Co., Niles, O.	1
Carnahan Tin Plate & Sheet Co., Canton, O.	7
Newport Rolling Mill Co., Newport, Ky.	1
N. & G. Taylor Co., Cumberland, Md.	8
Pope Tin Plate Co., Wheeling, W. Va.	12
National Enameling & Stamping Co., St. Louis	16
Griffith Charcoal Iron Mills, Washington, Pa.	2
Total mills	58

Sheet Mills.

The union sheet mills of the American Sheet & Tin Plate Co. and of the independents at present, are as follows:

AMERICAN.

Aetna Standard, Bridgeport, O.	23
Guernsey, Cambridge, O.	11
Midland, Muncie, Ind.	7
Piqua, Piqua, O.	4
Struthers, Struthers, O.	6
Total mills	51

INDEPENDENTS.

Zug Iron & Steel Co., Pittsburg	6
Follansbee Bros. Co., Follansbee, W. Va.	2
Whitaker-Glessner Co., Wheeling, W. Va.	7
Youngstown I. & S. Roofing Co., Youngstown, O.	7
Empire Iron & Steel Co., Niles, O.	5
Youngstown Sheet & Tube Co., Youngstown, O.	6
Newport Rolling Mill Co., Newport, Ky.	9
American Rolling Mill Co., Middletown, O.	4
National Enameling & Stamping Co., Granite City, Ill.	10
Niles Iron & Steel Co., Niles, O.	4
Western Tin Plate & Sheet Co., Greencastle, Ind.	7
Total mills	67

Judge Gary's Statement.

In explanation of the announcement by the American Sheet & Tin Plate Co., Judge E. H. Gary, chairman of the United States Steel Corporation, has made this statement:

Most of the mills of the American Sheet & Tin Plate Co. have for some years been operated as "open shops." The others were run as union mills, and with these the wage scale has been signed on July 1 of each year. The management of the American Sheet & Tin Plate Co. has discovered it has been discriminated against and in other ways unfairly treated by the Amalgamated Association; the management also discovered beyond question that a decided majority of the men prefer to have all the mills operated as "open shops."

Under these conditions it has become clear that it is for the best interests of the company and the operators to conform to the wishes of the majority. As a result the company posted notices accordingly and also posted the wage scale effective on and after July 1, which in all essential respects is unchanged. There is no dispute regarding wages. It is clear that the employes have appreciated the attitude of the company in its maintenance of the high level wages during the period of great business depression.

PHILADELPHIA FOUNDRYMEN'S ASSOCIATION.

At a meeting of the Philadelphia Foundrymen's Association, held Wednesday evening, June 2, attendance was interfered with on account of the strike of street railway employes, only 38 members being present. Edgar A. Custer, president of the Tacony Iron Co., read a paper on "The Production of Duplicate Castings in Permanent Molds," illustrated by lantern slides. The moving picture views showed the actual operation of a permanent mold in the foundry making a casting every 28 seconds from the same mold. Mr. Custer's paper was well received. G. W. Perry, of the Industrial Supply & Equipment Co., Philadelphia, read a paper on "Oxy-Acetylene Puttington Tool as Applied to Foundry Practice." This paper was illustrated by lantern slides. Mr. Perry also gave a short talk on Thwing's electrical radiating, recording and indicating pyrometers. The association adjourned until the first Wednesday in September.

The Pittsburg, Bessemer & Lake Erie railroad made a record last week when 43,000 tons of iron ore were loaded into steel gondolas at Conneaut from the boats in one day. Shipments of iron ore from Jan 1 to May 31 last, were 1,214,558 tons, comparing with 597,953 tons the corresponding period last year, an increase of 616,605 tons.

The advance statement of the United States Geological Survey shows that the production of refined copper of domestic origin in 1908 was 875,849,129 pounds, an increase of 11.6 per cent over that of 1907. The total output of refined copper (exclusive of domestic scrap, etc.) by domestic refineries in 1908 was 1,094.700,123 pounds.

The next meeting of the Lake Superior Mining Institute will probably be held some time in August.

CHEERS FOR DR. WILEY,

Representing America at the International Chemical Congress.

(By our special correspondent.)

London, May 27.—The Prince of Wales, who was accompanied by the princess, declared the Eleventh Congress open today in the vast Albert Hall, S. Kensington, in the presence of the largest gathering of chemists which has yet assembled at these tri-ennial congresses. As the eighth congress is to meet in New York, a few notes upon the inaugural meeting in London may be of interest to IRON TRADE REVIEW readers, more especially as the speech made by Dr. Harvey W. Wiley, as representative of America, was declared by many to be the best speech of the function.

The audience which greeted the Prince of Wales when rising to address the congress, numbered fully 4,000. His speech of welcome to the foreign representatives and delegates, with his weighty emphasis of the value of science, especially of chemical science, in the conduct of modern industries, was received with evident interest and attention by this large gathering.

The honorary president, Sir. Henry Roscoe, and the acting president, Sir William Ramsey, next addressed the congress, and repeated in other words the welcome extended to the delgates and members from other countries, by the prince.

Dr. Harvey W. Wiley, chief chemist of the bureau of chemistry, department of agriculture of the United States government, was the first called upon to reply, and his eloquent speech which was delivered with excellent effect, extempore, is given in part below. Prof. Armand Gautier, of the Sorbonne, Paris, Prof. Otto de Witt, of Charlottenburg, and Prof. Paterno, of Rome, then replied in rotation for their respective countries and countrymen, and Prof. Arrhemius, of Stockholm, performed a similar service for the remaining countries represented at the congress.

After the opening ceremony was over, members of the sections met in their various sectional meeting rooms, for election of officers and for organization of the work of their respective departments. Section III (mining and metallurgy) has a large program of papers to dispose of in the congress week, while Section X (electro-chemistry and electro-metallurgy) has an even larger program to read and discuss. A selection from these papers will be dealt with in my next report.

Dr. Harvey W. Wiley, in rising to respond for the United States, said that the assembling of the Seventh International Congress of Applied Chemistry was illustrative of the progress of the age. Chemistry was the fundamental science, in that it treated of the ultimate nature of things. It was also the science of most productive importance, because it was applied in all the industries. In so far as he knew, there was not a single industry of any importance to man that did not claim tribute of chemistry. The art of agriculture most of all lay at the very foundation of human happiness and existence. There was no more apt illustration of the utility of chemistry than to say that, were its principles unknown and unapplied, the teeming millions of the globe would at this moment be unclad and starving. But they were too much concerned at all times with mere material progress and prosperity. That nation was deemed most prosperous which was most wealthy, and the viewpoint of applied chemistry was too often restricted to the immeasurable services which chemistry had rendered in the increase of wealth. But, there was a more important service of chemistry to man even than that. The great strides now being made in applying the principles of prophylaxis in medical science were largely due to the services of chemistry. In fact, sanitation was principally a chemical problem, pure food, pure air, pure water insuring pure activity of mind and body, curing disease by evading it, and prolonging by many years the most valuable part of human life, that is, its period of maximum endeavor. And to this great work chemistry was giving its most precious contributions. (Cheers). In another important particular, chemistry was rendering service to humanity. It had undertaken to improve the morality of man. All science had a stimulating effect on morality, because science sought only the truth. Again, chemistry had already made great progress in improving the morality of trade. It detected fraud and adulteration in all articles bought and sold. It exposed to public scorn and to the penalties of the law the manufacturer and dealer who made and sold any article deleterious to man or under a false name or representation.

There were no means of bringing nations to a better understanding of their mutual hopes and endeavors, no better ways of preserving international peace and amity, than by securing the fruits of science borne by its application to all industries. In this hall were assembled delegates from all countries of the world. They had come to compare notes of progress, and to be mutually helpful in the work they were trying to do for the benefit of man. Their purpose was to ease, if possible, the sufferings of the poor, to lighten to some extent the task of labor by making it more fruitful, to prevent sickness and promote health, to prevent crime and punish wrongdoing, to eliminate from commerce every species of fraud and misrepresentation, and in that great work they were inspired by the patronage of their Royal English Highnesses. (Cheers).

NINE TALBOT FURNACES

Now Included in the Plants of the Jones & Laughlin Co.

The Jones & Laughlin Steel Co., at its South Side works, Pittsburg, has just completed and put in operation the last of the four Talbot continuous basic open-hearth furnaces, which gives it the largest installation of this class of steel making equipment. At the present time, the company has a total of nine Talbot open-hearth furnaces in its steel works, each of which has a capacity of about 225 tons. The construction of the additional four furnaces was begun several years ago, but was temporarily abandoned by reason of the business depression. The resumption of work was ordered about six months ago and the first furnace completed and fired Feb. 24 of this year. The finishing touches were put upon the last furnace and the first heat was run in the past several weeks. The new group of four furnaces is run by producer gas supplied by the Hughes producers, while the fuel used in the original five furnaces was natural gas. The completion of the new equipment materially increases the steel-making capacity of the Jones & Laughlin Steel Co., but present conditions in the market are such that the nine Talbots and the regular open-hearth furnaces are making a normal output.

The company is also making another important improvement to its South Side plant by the building of a new merchant bar mill which will roll rounds from 9/32 to 1½ inches, squares from 5/16 to 1½ inches and flats, etc., in proportion. The new mill will make a total of 13 merchant mills at the South Side plant.

EQUIPMENT REDUCTION.

Figures During Depression Made Available by Railroads.

During the late business depression it was a matter of common knowledge that the railways, in their efforts to reduce expenditures to the minimum, were allowing their equipment to run down to an extraordinary degree. Dependable information as to the extent to which this policy was pursued is now available through the car efficiency committee's report, presented at the spring meeting of the American Railway Association, held in New York City, May 18.

This report first refers to the idle freight car record of the past 18 months, covering the depression season, the highest number being 333,019 in January, 1909, since which time there has been a considerable decrease. The report then continues:

In comparing these figures with those for previous periods, consideration should be given to the shop cars, which are not included in the surplus figures. During July and August, 1908, the number of bad order cars averaged over 200,000, or more than 100 per cent above normal. This number has since been reduced, and about 100,000 cars thus added to the available supply on which the surplus figures are based.

As opposed to this, some allowance should be made for the gradual reduction in equipment, which has resulted from an almost total suspension of car building. It is true that this has been minimized by a similar suspension in the general retirement of old cars, but it is probable that the net decrease in equipment during the past years has been close to 1.5 per cent, or something over 30,000 cars for the entire country.

The percentage of cars in shop is quite sensitive to the condition of car supply. From 5.27 per cent in November, 1907, the number of bad-order cars increased with the surplus until, in July, 1908, the figure was 10.18 per cent. The reduction in the surplus was followed immediately by a decrease in the shop per centage, notwithstanding the fact that the restoration to service of stored cars developed defects in many supposed good-order cars that transferred them for the time to the shop class.

A table presented with this report shows that, with the exception of the first quarter of 1908, the percentage of cars in shop was extremely heavy throughout the year, the average being well over 9 per cent as against a normal of perhaps 5 per cent.

Mr. Vuibert, director of Vuibert & Nony, publishers, 63 Bld. St. Germain, Paris, announces the translation of "Social Engineering," a volume of studies of American life and labor, by Dr. W. H. Tolman, director of the Museum of Safety and Sanitation. Andrew Carnegie has written the introduction and the translation is in the hands of Pierre Janelle. It is expected that the foreword of the French edition will be by Prof. Levasseur, administrateur College de France. The book was published in the United States by the McGraw Publishing Co., New York, in February of this year.

THE EMERSON PREMIUM EFFICIENCY SYSTEM.

Editor IRON TRADE REVIEW:—

Sir—In the issue of THE IRON TRADE REVIEW of July 23, 1908, under the heading, "The Various Plans for Payment of Wages," may be read an article by Harrington Emerson, in which he describes what he calls his "Santa Fe" or "Efficiency Premium" system.

As illustrating the working of his system, Mr. Emerson writes of a case where the guaranteed rate per hour is 30 cents, the initial time (the number of hours at which the efficiency premium begins) is 18 hours and the standard time ("the most important point on which everything else depends") is 12 hours. Mr. Emerson tells us that "the theory of the Santa Fe system is that for standard time the worker deserves 20 per cent premium, but that for less than standard time he should receive smaller premiums until at time and a half, 18 hours (initial time), he receives no premium." I assume that Mr. Emerson knows that "less than standard time" should here read "more than standard time."

Mr. Emerson gives us no information as to his method of calculating the premium when the time taken is more than standard time, but he does tell us, and this is the very point with which I am concerned, that "below standard time the worker not only receives full wages for all the time he has saved below standard but he is also paid 20 per cent premium on the time he actually works."

To examine what the practical results of the principle thus enunciated would be, let us consider the performance of some specific operation the standard time for which is 12 hours and the guaranteed rate per hour 30 cents. Suppose that one worker, "A," has completed the operation in six hours and thereby saved six hours, and that another worker, "B," has completed the identical operation in 11 hours and thereby saved but one hour. Since both "A" and "B" have completed the operation in less than standard time, each will receive wages for the whole number of hours of the standard time, i. e., 12 hours, which at the guaranteed rate of 30 cents per hour equal $3.60. In addition, "A" will receive a premium of 20 per cent of the wage value of the number of hours worked by him, i. e., 0.2 (6 × 0.30) or 36 cents, and "B" will receive a premium of 20 per cent of the wage value of the number of hours worked by him, i. e., 0.2 (11 × 0.30) or 66 cents, so that "A" 's total pay for the operation will be $3.60 plus 36 cents; that is, $3.96; and "B" 's total pay for the operation will be $3.60 plus 66 cents; that is, $4.26. Is it not clear from this that although "B" has saved but one-sixth of the time saved by "A" and has utilized the facilities of the shop for a period nearly twice as great, his efficiency premium will be 66 cents as against "A" 's efficiency premium of only 36 cents?

Would not the application of Mr. Emerson's efficiency premium system with its premium based upon the number of hours worked, encourage the slow worker to be even slower and discourage the skillful, quick worker from performing any operation in less than its standard time and therefore *automatically operate to increase the labor cost of each unit of production?*

I may be wrong, but as I understand the matter, it is a primary requirement of any really efficient plan for the payment of wages that it operate to reduce the cost per unit of production.

JAMES V. SHIELDS.

259 Van Brunt St., Brooklyn, N. Y., May 29, 1909.

HARDWARE MEN

In Pittsburg Began Three Days' Meeting With Large Attendance.

The joint meeting of the Southern Hardware Jobbers' Association and the American Hardware Manufacturers' Association opened a three days' session at the Hotel Schenley, Wednesday, May 9, with a large attendance.

The jobbers' association includes all the principal hardware corporations and firms and individuals in the middle, southern and southwestern states, while the American Hardware Manufacturers' Association comprises within its membership many of the principal manufacturing firms in the country. The Pittsburg membership includes all the large steel and iron companies in the district, also those who make shovels, axes, tools, bolts, hinges and other associate lines.

A varied and continuous program has been provided for the three days of the convention. Aside from the business sessions, there will be an open air smoker and vaudeville show, trolley rides, dinners, teas, receptions, bridge parties, automobile rides, luncheons, and a dance Friday night at the Hotel Schenley.

The speakers at the banquet Thursday evening will be: Hon. James Francis Burke, toastmaster; Hon. John Barrett, director of the International Bureau of American Republics, Washington, D. C., will speak on "America's Great Foreign Commercial Opportunity." Mr. Barrett was formerly United States minister in Siam, special commissioner in China, Japan and the Phillipines and United States minister to the Argentine Republic, to Panama and to Columbia. The next speaker will be Hon. J. Sloat Fassett, M. C., of Elmira, N. Y., whose subject will be "A Merchant Marine." Hon. Joseph Buffington, United States circuit judge, will speak on "A Good Natured Understudy."

OUR FOREIGN COMMERCE

Iron and steel exports in April were the heaviest since Novmber, 1907, reaching a total of 100,903 gross tons, against 94,522 tons in the preceding month and 96,681 tons in March, 1908, which otherwise held the record since November, 1907.

April showed an excellent gain over the average of the intervening months, as the 16 months, December, 1907, to March, 1909, showed an average of 81,235 tons, and the exports of 100,903 tons in April showed a gain of 24 per cent over this average. The average for the 10 months ending with April was 83,473 tons, and the April gain of 17,430 tons over this average was well placed as to degree of manufacture. Pig iron showed a decrease of 1,500 tons and structural iron and steel a decrease of 2,300 tons. The important increases were: Crude steel, 3,400 tons; wire rods, 1,000 tons; steel bars, 1,600 tons; sheets and plates, 5,500 tons; wire, 1,700 tons; pipes and fittings, 8,400 tons. The remarkable gain in pipes and fittings made it that in April this line, with 18,023 tons exported, came within 223 tons of being the heaviest line of export. Rails, however, came first in April, with 18,246 tons, pipes and fittings being a close second, while sheets and plates came third, with 16,331 tons.

Taking the 10 months ending April there were no less than four separate lines each of which showed exports averaging more than 10,000 tons a month, these being, in order of prominence, rails, wire, pipes and fittings and sheets and plates.

Exports by Months.

Our iron and steel exports by months since the beginning of 1907 are given in the table below, which shows the steady gain there has been since a low point was reached last November:

TOTAL IRON AND STEEL EXPORTS, GROSS TONS.

	1907.	1908.	1909.
January	102,630	74,353	70,089
February	64,728	81,773	84,860
March	112,787	96,681	94,522
April	132,792	93,285	100,903
May	91,543	64,020	.....
June	92,996	69,779	.....
July	122,249	86,806	.....
August	118,792	87,244	.....
September	114,819	76,727	.....
October	123,170	85,668	.....
November	116,308	71,028	.....
December	86,019	77,656	.....
Total	1,301,979	964,266	350,374

Fiscal Year Total.

Assuming that exports in May and June will prove to be at the average rate of March and April our total iron and steel exports for the fiscal year ending with this month will be about 1,030,000 gross tons, thus passing the million-ton mark, which the calendar year 1908 failed to do by 36,000 tons. Such exports would compare with previous fiscal years as follows:

IRON AND STEEL EXPORTS, FISCAL YEARS:

1904	676,590
1905	1,123,580
1906	1,331,323
1907	1,229,245
1908	1,161,270
1909	1,030,000*

*Estimated.

Value of Exports.

The value of all iron and steel exports, including that of the tonnage lines referred to above, and the value of hardware, machinery, etc. (not including agricultural machinery), has been as follows:

Ten months ending April,	
1907	$149,710,560
1908	161,022,823
1909	118,207,011

The decrease has not been as great in quantity as in value, as slightly lower values have prevailed in the international markets of late. The exports in April of this year show a good gain over the average of the 10 months ending April, as the April exports were valued at $13,058,054, while the average value per month for the 10 months was $11,820,701, the gain in April being about 10 per cent.

Alleged Iron Plate Exports.

Some time ago this summary adopted the practice of adding together the government returns of "iron sheets and plates" and "steel sheets and plates," it not being believed that all the material reported as iron was actually iron. The production statistics which have recently appeared afford a means of comparison. The government returns showed, for the calendar year 1908, exports of 44,100 gross tons of "iron sheets and plates" and 60,893 tons of "steel sheets and plates." Outside of the question of whether it is probable that foreign buyers would really take sheets and plates in this proportion, it is to be noted that the official statistics show production in the year to have been 54,033 tons of iron sheets and plates and 2,595,660 tons of steel sheets and plates. To accept the figures as furnished to the government would require us to believe that in 1908 we exported 82 per cent of our production of iron sheets and plates, and only 2 per cent of our production of steel sheets and plates. That would be rather a strain upon credulity. Indeed, the export statistics are on the danger line. It would require little more to find that we exported more iron in this form than we made!

Imports Continue Light.

Our imports continue light. In April they totaled 17,772 gross tons, while the monthly average in the 10 months ending April was 17,432 tons. These imports, in which the lawmakers at Washington are taking such an interest, have been of very minor consequence. Of the 174,321 tons in the 10 months, 85,285 tons is designated as "pig iron" in the general statistics, but fully half the total was probably ferro-manganese and spiegeleisen, which are produced in the United States in relatively limited quantities, while 40,237 tons was tin plate, the great bulk of which is for rebate purposes. In the past 10 years more than 90 per cent of the tin plate imported has been re-exported in the form of containers, etc., with the rebate of 99 per cent of the duty originally paid. Deducting imports of ferro-manganese and spiegeleisen and of tin plate for drawback purposes, the iron and steel imports in the past 10 months have totaled less than 100,000 tons, or an average of less than 10,000 tons per month. It is quite improbable that the tariff revision now in progress will make any serious impression upon these statistics.

IRON AND STEEL EXPORTS, GROSS TONS.

	—April,—		Ten months ending April,	
	1908.	1909.	1908.	1909.
Scrap	3,576	2,155	16,687	17,374
Pig iron	5,153	2,206	43,991	37,211
Billets, sheet bars, etc.	3,819	11,857	83,479	84,776
Wire rods	713	2,060	5,671	9,769
Rails	20,352	18,246	251,668	182,521
Structural iron and steel	13,744	6,346	120,791	87,011
Bar iron	302	838	11,810	9,238
Steel bars	3,494	5,709	57,289	40,698
Sheets and plates	7,241	16,331	86,999	107,906
Tin plates	5,005	556	12,677	3,824
Hoop, band and scroll	331	238	8,115	2,944
Wire	13,610	12,768	134,467	110,484
Wire nails and spikes	2,253	2,078	32,643	22,768
Cut nails and spikes	1,039	1,035	5,366	6,186
All other, including tacks.	332	457	5,045	5,495
Pipes and fittings	12,331	18,023	150,755	106,524
Totals	93,285	100,903	1,027,453	834,729

IRON AND STEEL IMPORTS, GROSS TONS.

	—April,—		Ten months ending April,	
	1908.	1909.	1908.	1909.
Scrap	111	245	17,077	4,490
Pig iron	3,003	8,117	189,776	85,285
Billets, bars and steel n. e. s.	797	922	14,582	10,516
Wire rods	706	914	11,831	9,828
Rails	417	85	2,626	1,286
Structural	53	393	1,418	5,321
Bar iron	830	755	31,345	13,550
Sheets and plates	245	389	2,230	2,818
Tin plates	6,155	5,895	48,538	40,237
Hoop, band and scroll	26	57	463	990
Totals	12,343	17,772	319,886	174,321

MANY BUILDINGS

Contracted For in New York to Use Bethlehem Sections.

A number of important building projects in New York city and its vicinity, for which Bethlehem sections have been specified, have been closed within the past few weeks. This includes some projects which have not been noted in the market reports, and the total amount of material aggregates about 15,000 tons. Among the buildings enumerated are the following:

The American Tobacco Co., Jersey City, N. J., 3,000 tons, fabricated by the Hay Foundry & Iron Works.

Irons & Todd, Eighteenth and Nineteenth treets and Fourth avenue, 12-story building, 4,000 tons, fabricated by the Hay Foundry & Iron Works.

L. P. Hollender, 5527 Fifth avenue, New York city, 450 tons, fabricated by the Hinkle Iron Co.

Addition to office building at Sixteenth and Broadway, New York city, about 200 tons, fabricated by Alfred E. Norton Co.

A. C. & H. M. Hall Realty Co., 12-story apartment at Broadway and Nineteenth street, 350 tons, fabricated by Ravitch Bros.

The Building & Engineering Co., 12-story building at 928-930 Broadway, 500 tons, fabricated by the Radley Steel Construction Co.

H. Wolff, 518-534 West Twenty-Sixth street, 3,000 tons, fabricated by the Hinkle Iron Co.

Acme Building Co., 129-131 West Twenty-Second street, 250 tons, Radley Steel Construction Co., fabricators.

Addition to building at 29 Broadway, 250 tons, fabricated by the Hinkle Iron Co.

Twelve-story building for Broadie, Adler & Kock, at Twentieth street near Sixth avenue, 800 tons, fabricated by the A. E. Norton Co.

Building for the Kips Bay Realty Co., at the southwest corner of Irving place and Sixteenth street, New York City, 12 stories, 120 x 125 feet, 700 tons, to be fabricated by the Hay Foundry & Iron Works.

McMorrow Engineering & Construction Co., building at 552-556 West 157th street, Manhattan, 75 feet x 84 feet 2 inches, eight stories and cellar, requiring 140 tons, to be fabricated by Ravitch Bros.

The McMorrow Engineering & Construction Co., 10-story building at the southeast corner of 157th street and Broadway, 99 feet 11 inches by 115 feet, 320 tons, Ravitch Bros. fabricators.

B. Crystal & Son, nine-story building at Riverside drive, north of 116th street, 78 x 84 feet, requiring 110 tons, fabricated by Ravitch Bros.

Meteor Realty Co., 40-42 West Seventeenth street, 50 x 92 feet, 12 stories and cellar, requiring 290 tons, to be fabricated by Ravitch Bros.

Twelve-story building at 243-249 West Seventeenth street and 232-234 West Eighteenth street, for Seventeenth Street Co., 50 x 184 feet, 500 tons, Ravitch Bros., fabricators.

Ed. Poerschke, 97 Elizabeth street and 213-217 Grand street, nine-story building, 74 x 93 feet, 200 tons, to be fabricated by Ravitch Bros.

IRON ORE DEVELOPMENT WORK IN NORTHERN NEW YORK.

Considerable activity is to be noted among the mining interests operating in the Adirondack region, particularly in the vicinity of Port Henry, and the district is now in position to furnish the largest output in its history. Interest largely centers, of course, in the Lake Sanford deposit of titaniferous magnetites owned by the MacIntyre Iron Co., with offices at Port Henry and Tahawus. This ore will concentrate close to 60 per cent, with not over 6 per cent of titanium and very low phosphorus. The deposit is of such a character that it can be developed as an open pit proposition and can be delivered to the concentrator at an extremely small expense. To reach it, however, a railway connection some 50 miles in length will have to be built through a mountainous country, though no particularly difficult grades will be encountered. It is now probable that this line will be run through to Lake Champlain, connecting at one of the lower lake ports, in order to make use of the facilities for water shipment which will be afforded by the completion of the 2,000-ton barge canal. The deposit has been proved up with the diamond drill and is of enormous thickness.

At Mineville, a large amount of machinery is being installed by Witherbee, Sherman & Co., Inc., principally for additional power purposes. An additional steam turbine unit is being placed in the plant at Port Henry, from which power is conveyed five miles inland to the mines. The Port Henry Iron Ore Co. is at work on the foundations for a large new head frame near the famous "21" mine at Mineville. Considerable work is also being done on the Lake Champlain & Moriah railroad, owned jointly by the two companies operating at Mineville, chiefly in the way of eliminating the switches.

The Cheever Iron Ore Co., with offices at Port Henry, is operating one shift full time on the separating plant installed some little time ago at the old Cheever mines, two miles up the lake shore. The concentrator is working largely on the leaner ores passed over in the early operation of this famous old mine, and a ready sale is found for its entire output. A cable device has been provided by which the weight of the loaded cars descending the sharp incline to the shore of the lake hauls the empties back to the concentrating house.

It will probably be several weeks before work will be begun on the installation of the steam turbine blower for the Northern Iron Co. furnace at Port Henry, contracts for which were recently noted. When this is in place, it is probable that one of the older stoves will be replaced; contracts are understood to have been let for additional stove capacity. The furnace is operating entirely on Port Henry magnetites, well over 90 per cent of which are concentrates, and is yielding the largest output in its history. This furnace and that at Standish are equipped with a gas washer developed by F. E. Bachman, who is in charge of operations at Port Henry.

Important additions to equipment are also being made at Benson mines, a considerable distance west of the Tahawus district, where the Benson Mines Co. has recently awarded contracts to Reeves Bros., Alliance, for the construction of a nodulizing plant. This will probably be completed within the next two or three months.

In the Herkimer district, near Utica, the Salisbury Steel & Iron Co. several months ago let contracts for the construction of an extensive separating plant, but the construction of this has been delayed and it is not yet ready for operation.

The equipment of the old Forest of Dean mine, only a short distance up the Hudson from New York, has been improved during the past few months and these workings are being operated to capacity, the ore being shipped to various furnaces in the eastern district. The Hudson Iron Co., which ordinarily utilizes the output of the mine, has its Secaucus furnace out of blast for rebuilding.

King Bridge Awarded.—The injunction suit brought by County Prosecuting Attorney Cline, at Cleveland recently to test the validity of the Denison-Harvard viaduct contract let to the King Bridge Co. by the commissioners of Cuyahoga county, was dismissed June 4 by agreement of attorneys, and the case will now be hurried to the circuit court and from there to the state supreme court. This suit was originally brought at the request of the county commissioners, who anticipated like action by the McClintic-Marshall Construction Co., claiming to be the lowest bidder.

The United States Steel Corporation has sold $9,000,000 first mortgage bonds of the Chicago, Lake Shore & Eastern railroad. These bear 4½ per cent interest and mature in 60 years, though they are redeemable in 10 years at 110 and interest.

FURNESS MOVEMENT

Favoring Employes' Co-partnership is Progressing.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., May 15.

The capital and labor co-operative movement initiated by Sir Christopher Furness goes steadily forward. Sir Christopher has recently acquired the Wingate colliery, Durham, which employs 1,500 men, and he has invited the men and boys to meet him at Wingate on May 21, with a view to discussing with them his co-partnership ideas as to the working of the colliery. Two days ago Lady Furness christened the first steamship turned out under the co-operative scheme, the Asiana, built for the Furness line at the Middleton shipyards.

Remarkable scenes attended the reopening of the Barrow steel works which have been closed for more than a year. Work was found on last Monday for about 900 men, and the occasion caused great rejoicing. Special thanksgiving services were held in all the churches and an open-air service was held in the schoolyard of St. James' church, at which the mayor and the vicar were the principal speakers.

The shipbuilding trade improves but slowly. The output of the Clyde shipbuilding yards during April numbered 25 vessels of 29,000 tons. This is an increase of only 1,000 tons on March and a decline of 9,500 tons compared with last year. So far the work is not panning out so well for May, and does not look like equaling the orders received during March which represented 100,000 tons.

Excellent progress is being made with the fund to provide a permanent memorial of the late Sir David Dale, who was president of the British Iron & Steel Institute, 1895-97, and who is also well remembered not only as an iron master and manufacturer on a large scale, but also as the founder of the Northern Wages Board and one of the pioneers of the conciliation movement. A sum of nearly £12,000 has been collected and it is proposed to raise sufficient to provide an income of £500 a year in order to found a professorship of economics at Armstrong college, Newcastle-on-Tyne.

A memorial to another well-known employer, the late A. Baldwin, the head of a firm having large works both in the Midlands and in Wales, has just been inaugurated. Mr. Baldwin represented the Bewdley division in parliament. Fifty lodges of Odd Fellows and Courts of Foresters, of which he was an honorary member, have subscribed for a memorial to be placed in Mr. Baldwin's parish church at Wilden, Worcestershire. The church was erected and handsomely endowed by Mr. Baldwin.

THE DUKE OF DEVONSHIRE, PRESIDENT-ELECT OF THE IRON AND STEEL INSTITUTE.

The announcement at the recent London meeting of the Iron and Steel Institute that the Duke of Devonshire had accepted nomination for

THE DUKE OF DEVONSHIRE,
President-Elect of the Iron and Steel Institute.

the presidency next year gave great satisfaction, and from some points of view will be regarded as an ideal selection. The duke has, if not exactly youth on his side, the advantage of the prime of manhood. He was born in 1868 although the pronounced grayness of his abundant hair suggests that he is some years older. The presidency will be once more in the hands of one of the most distinguished from the point of view of heredity of the British nobility. The young duke is very rich, owning 186,000 acres of land, including valuable minerals in Lancashire and Derbyshire. He owns some nine or 10 country mansions, of which Chatsworth House has a world-wide fame as one of the most beautifully situated and lavishly furnished of England's country seats. In addition there is Hardwicke Hall, Holke Hall, Westmoreland, Bolton Abbey in Yorkshire, Compton Place, Eastbourne, and Lismore Castle, Waterford Island. His iron and steel interests are large, his principal position being the directorship of the Barrow Hematite Steel Co., which is capitalized at close upon a million, and for which firm he is trustee for the debenture holders. For a comparatively young man, the duke has had his share of distinction, having been for some years a privy councillor and a fairly active Liberal-Unionist member of parliament from 1891 until his succession to the dukedom. He has been singled out also for royal favor, having been treasurer of the household of the late Queen Victoria, and subsequently of King Edward. There is a kind of apostolic succession about the presidency, as his grandfather, the seventh duke, was the first president of the Institute and for many years the distinctive profile of the duke adorned all Institute documents. In addition to his title of Duke of Devonshire, he is also Marquis of Hartington. In politics he belongs rather to the solid, plodding order like his late uncle than to the brilliant line, but his predecessor in the dukedom had a remarkable faculty for "getting there" in whatever line of policy he undertook. For business acumen and shrewdness it will probably be found that he will maintain the reputation of his line.

Refused to Interfere.—Vice Chancellor Garrison, of Jersey City, has refused to grant a restraining order against the organization committee of the Southern Steel Co., designed to prevent it from participating in the organization of the Southern Iron & Steel Co.

United States Consul-General Robert J. Wynne at London quotes the president of the British Board of Trade to the effect that the total value of exports of tin plate from the United Kingdom from 1904 to 1908 was $103,623,669, the highest figure for one year being $24,737,509 in 1905. During the five years the value of exports to the United States was $20,455,530, and the value of tin plate exports from the United States to England was $9,295.

The Crucible Steel Co. of America has sold a part of its Howe-Brown property at Pike and Sixteenth streets, Pittsburg, to the Pennsylvania railroad. The property has been idle for a number of years and will be utilized by the railroad company for an extension of its produce yards.

NOTES ON TESTS FOR HARDNESS[1]

By Prof. Thomas Turner, M. Sc.[2]

Few properties of iron and steel are of more importance than that of hardness. In some cases, as with a cutting tool or a pressure die, the metal is practically valueless unless it can retain a sharp edge; while in other instances, where the material has to be machined or cut and trued to shape, even a relatively slight increase of hardness is the cause of much inconvenience and expense. In a third class of material a good wearing surface is of prime importance; while, lastly, hardness may often serve as an indication of a degree of brittleness and untrustworthiness which might perhaps be otherwise unsuspected.

Hardness may be defined as the property of resisting penetration, and, conversely, a hard body is one which, under suitable conditions, readily penetrates a softer material. There are, however, in metals various kinds or manifestations of hardness according to the form of stress to which the metal may be subjected. These include tensile hardness, cutting hardness, abrasion hardness, and elastic hardness; doubtless other varieties could also be recognized when the experimental conditions are modified so as to bring into operation properties of the material in addition to that of simple, or what may be conveniently called mineralogical hardness. This has been defined by Dana as "the resistance offered by a smooth surface to abrasion." The usual quantitative tests for hardness are static in character, but the conditions are profoundly modified when the penetrating body is moving with greater or less velocity. The resistance to the action of running water; to the effect of a sand-blast; or to the result of the pounding of a heavy locomotive on a steel rail, afford examples of what might perhaps for purposes of distinction be called dynamic hardness, which is a branch of the subject which has received little quantitative examination.

Just as the pressure of a gas, at a given temperature, is proportional to the number of molecules in a unit space, so in the case of a homogeneous solid substance, such as a pure metal, it may be assumed that the resistance to the entry of another body will increase as the number of atoms in a unit volume increases. Hence, as originally pointed out by Bottone in 1873, hardness varies inversely as the atomic volume. In other words soft metals have a high, and hard metals a low atomic volume. This can perhaps be best seen when the common metals are arranged in four groups, which may be called hard, medium hard, soft, and very soft respectively, thus—

	Atomic Volume.
GROUP I.—HARD.	
Nickel	6.7
Cobalt	6.9
Manganese	6.9
Iron	7.2
Copper	7.2
Chromium	7.7
GROUP II.—MEDIUM.	
Zinc	9.1
Platinum	9.1
Gold	10.2
Silver	10.2
Aluminum	10.6
GROUP III.—SOFT.	
Cadmium	12.9
Magnesium	13.8
Tin	16.1
Lead	18.1
Bismuth	21.1
GROUP IV.—VERY SOFT.	
Sodium	23.7
Potassium	45.4

This rule does not rigidly hold good in all cases, but it would probably be more nearly universal if the metals were tested at a temperature suitably removed from their melting point. Calcium, for example, has an atomic volume of 25.4, and might therefore be expected to have a low melting-point, and to be soft. On the contrary it melts in the neighborhood of 900 degrees Cent., and its hardness is about 9 on the scleroscope scale. It is in fact hard enough to require a metal-saw or a cold-chisel. Doubtless it would be much softer if it were tested at, say, 150 or 200 degrees below its melting point when it would more nearly resemble tin or lead at ordinary temperatures.

It is well known that many alloys are harder, and consequently wear better than either of their constituent metals. Familar examples of this characteristic are met with in gold and silver coinage alloys, and in bronzes. The zinc copper series also yields alloys harder than either zinc or copper. One alloy in this series, prepared in my laboratory in a very interesting series of tests recently conducted by M. T. Murray, was found to have a hardness just twice as great as that of mild steel. The general principles in relation to the hardness of alloys have hitherto been but little studied, and are only now beginning to be understood. Dr. C. Benedicks has suggested the general rule that the hardness of solid solutions (alloys) becomes greater as the osmotic pressure increases, and has supplied some examples in support of this contention. The results of experiments conducted by two Russian investigators, and lately published, appear to show that when two metals unite to form a solid solution there is an increase of hardness. When the two metals form a continuous series of mixed crystals, the curve of hardness is a continuous one which passes through a maximum, and this point of maximum hardness generally corresponds with that of minimum electric conductivity. When the metals form alloys which solidify as a mechanical mixture of two components the hardness curve is approximately a straight line. When the metals form only a limited series of mixed crystals the curve of hardness is a combination of the two forms previously mentioned; while, lastly, if the two metals form a definite chemical compound this may be either harder or softer than the constituents. In many of the iron and steel alloys a continuous series of mixed crystals is obtained, and as a result there may be expected a continuous hardness curve, with a maximum at a given proportion. As heat treatment leads to the formation or decomposition of solid solutions, the resulting hardness will naturally vary according to the nature of the change which takes place.

In a standard text-book of Physics by Daniell, published a quarter of a century ago, it was stated that "Hardness is a property that cannot be measured." Originally the file or the tool was the only kind of instrument used for such tests, and metal was classed as "'soft," "hard," "very hard," etc.

Reamur in 1722 described two methods of testing the relative hardness of steel. In the first a bar of steel was divided into equal lengths by parallel straight lines, and one end of the bar was hardened. The steel to be tested was made into the form of a graving tool, and the particular division on the bar which it was able to mark was noted. In the other method the two pieces of steel which were to be compared were shaped into small test bars, the section of which

[1]A paper read at the May meeting of the Iron and Steel Institute.
[2]University of Birmingham.

was a right-angled triangle. These bars were so placed that the edges could be pressed together, and the depth of the indentation was taken as a measure of the relative hardness. These are the earliest recorded attempts at a quantitative measure of hardness with which I am acquainted.

To the mineralogist we owe the first definite numerical scale (Mohs), and the use of the sclerometer. To the officers of the United States ordnance department in 1856 we owe the method of indentation with a weighted punch, and the measurement of the volume of the indentation so obtained. Engineers have introduced drilling, grinding and rubbing tests, but to German physicists we chiefly owe the modern conception of an absolute scale of hardness expressed in terms the stress per unit area which is required in order to produce penetration. Those interested in the bibliography of the subject will find numerous references in the author's paper on "The Hardness of Metals," published in the *Chemical News* in 1886; in the paper on a microsclerometer by Jaggar in the *Amer. Journ. Sci.*, 1897, Vol. IV, p. 399, and particularly in the reports prepared by Mr. Osmond in 1893 for the Commission des Methodes d' Essai.

For the purpose of this brief paper comparison will be made of only four typical methods of measuring hardness. Those selected include the sclerometer, introduced by the author in 1886; the scleroscope, recently invented by Shore; the form of indentation test adopted by Brinell about 10 years ago; and the drill test introduced by Keep a few years earlier. Each of these methods has been used in actual works practice, and by various persons other than the inventor, and may thus be regarded as being typical of the particular class of test to which it belongs. Among the many other forms of test the microsclerometer and wearing tests call for special mention, though to these only incidental reference can be made.

The principles underlying the four methods selected for comparison may be briefly described as follows:

1. *Turner's Sclerometer.*—In this form of test a weighted diamond point is drawn, once forward and once backward, over the smooth surface of the material to be tested. The hardness number is the weight in grams required to produce a standard scratch. The scratch selected is one which is just visible to the naked eye as a dark line on a bright reflecting surface. It is also the scratch which can just be felt with the edge of a quill when the latter is drawn over the smooth surface at right angles to a series of such scratches produced by regularly increasing weights.

2. *Shore's Scleroscope.*—In this instrument a small cylinder of steel, with a hardened point, is allowed to fall upon the smooth surface of the metal to be tested, and the height of the rebound of the hammer is taken as the measure of hardness. The hammer weighs slightly over 2 grams, the height of the rebound of hardened steel is in the neighborhood of 100 on the scale, or about 160 millimeters, while the total fall is about 10 inches or 26 centimeters.

3. *Brinell's Test.*—In this method a hardened steel ball is pressed into the smooth surface of the metal so as to make an indentation of a size such as can be conveniently measured under the microscope. The spherical area of the indentation being calculated, and the weight being known, the stress per unit of area when the ball came to rest is calculated, and this gives the hardness number. Within certain limits the value obtained is independent of the size of the ball, and of the amount of pressure. In the original tests the steel ball was 10 millimeters in diameter, and the pressure was equal to a weight of 3,000 kilograms; but a more convenient form of apparatus is now supplied by Mr. Brinell for works tests, while Mr. Stead has introduced a small, and portable instrument. L. Grenet has also recently described a simple method of performing comparative ball indentation tests with the use of an ordinary vise or press.

4. *Keep's Test.*—In this form of apparatus a standard steel drill is caused to make a definite number of revolutions while it is pressed with standard force against the specimen to be tested. The hardness is automatically recorded on a diagram on which a dead soft material gives a horizontal line, while a material as hard as the drill itself gives a vertical line, intermediate hardness being represented by the corresponding angle between 0 degree and 90 degrees.

Each form of test has its advantages and its limitations. The sclerometer is cheap, portable, and easily applied, but it is not applicable to materials which do not possess a fairly smooth reflecting surface, and the standard scratch is only definitely recognized after some experience. The Shore test is simple, rapid, and definite for materials for which it is suited, and appears likely to have an important future. But further information is yet needed as to the exact property which is measured by this form of test. As shown by De Freminville, the result obtained varies somewhat with the size and thickness of the sample, while if the test piece is supported on a soft material such as a plasticine the results are valueless. It may, however, be pointed out that India rubber gives a rebound of 23, which is equal to that of mild steel; while I have found light soft pine wood give a rebound of 40, which is nearly double as great as that of gray cast iron. Curiously enough hard wood, like teak, gives a rebound of about 12, while some samples are considerably lower than this. As illustrating the influence of the support, a sample of exceptionally hard rolled copper about 1/25 of an inch in thickness, when supported on a block of hard steel, and tested with the blunt or "magnified" hammer supplied, gave a value of 30, which was increased to 34 when the copper was supported on wood. A sample of brass only gave a value of 17, and yet this brass would scratch the copper, while the copper would not scratch the brass. From these results it is evident that the Shore test is only applicable to a certain class of substances. It appears to test what may be termed the "elastic hardness," and gives high results with metals in the "worked hard" or *ecroui* condition; values which are not fully confirmed by the tool or by the sclerometer. My tests appear to show that good results are, however, obtained with glass and with porcelain, as well, of course, as with most metals.

The Brinell test is specially useful for constructive material; it is easily applied and definite, and is now of all hardness tests the one most employed. It appears to give satisfactory results with wood, but cannot be applied to very brittle materials such as glass, or to hard minerals. Keep's test is specially suited for castings of all kinds, as it records not merely the surface hardness, but also that of the whole thickness, and gives indications of blowholes, hard streaks, and spongy places. Obviously it can only be applied to materials the hardness of which is less than that of hardened steel.

A very important question arises in connection with these various tests, namely, as to whether there is any observed agreement between the results which are arrived at by such entirely different methods. It will be noticed that in each case an arbitrary

scale is adopted. If the weights used on my own apparatus had been ounces instead of grammes the hardness numbers would naturally have been different. Similarly Brinell's tests might have been expressed in tons and inches, or a different weight of hammer and height of scale adopted by Shore. Hence all that can be expected is a proportionality in the results, and if this is ascertained it should be possible to convert values on one scale into results on another. In the earlier experiments, conducted about half a century ago, this proportionality was markedly absent. Thus, comparing the researches of Calvert and Johnson with those of Bottone, we find:

	Calvert and Johnson.	Bottone.
Hardness of iron divided by hardness of copper.....	3.0	1.0
Hardness of iron divided by hardness of lead.....	58.0	2.5
Hardness of platinum divided by hardness of zinc.....	2.0	1.0
Hardness of cadmium divided by hardness of tin.....	4.0	1.0

An examination of results obtained by the four methods dealt with in this paper, however, shows that, for relatively pure metals in their cast or normal condition, there is a general agreement which must be regarded as remarkable. In Table I. will be found in the first column, results which were published in my original paper on the hardness of metals in 1886. In the second column are my own results with the Shore scleroscope, and these figures are in good agreement with those supplied by the maker of the instrument. In the third column are values taken from published results by Mr. Brinell and by Mr. Stead, but the numbers given have been divided by 6, as this figure has been found to suitably reduce the Brinell hardness values for purposes of comparison. In the last column reference is made to Mr. Keep's method. It will be observed that either by accident or design the scale adopted for the scleroscope is, for practical purposes, identical with that of the sclerometer, while Mr. Brinell's values are proportional, but about six times as great. The angles in Keep's tests are, or could easily be made, in pretty close agreement with the other values. It would therefore appear that each instrument, with simple and homogeneous substances, must measure one and the same physical property, and gives results which are either in actual agreement with, or proportional to, the results obtained by the other forms of test.

TABLE I.—HARDNESS SCALES COMPARED.

Metal.	Turner. (Sclerometer.)	Brinell. Sclero-scope.	Brinell. ..	Keep.
Lead	1.0	1.0	1.0	
Tin	2.5	3.0	2.5	
Zinc	6.0	7.0	7.5	
Copper, soft	8.0	8.0	6.0	
Copper, hard	...	12.0	12.0	Angle
Softest iron	15.0	...	14.5	varies
Mild steel	21.0	22.0	16 24	from 0°
Soft cast iron.....	21-24	24.0	24.0	to 90°
Rail steel	24.0	27.0	26-35	
Hard cast iron....	36.0	40.0	35.0	
Hard white iron...	72.0	70.0	75.0	
Hardened steel	...	95.0	93.0	

In practice, however, the use of relatively pure metals in the unworked or annealed condition is comparatively rare, unless we include in this category wrought iron and mild steel. Carbon steels and special steels consist largely of solid solutions, the complexity of which is profoundly modified by heat treatment; while copper, zinc, and their alloys are frequently hardened by rolling, drawing, or other mechanical treatment. The very important question therefore arises as to the extent to which the different methods of testing agree in their values for the hardening and tempering of steel, and for *ecroui* or hardness caused by mechanical treatment. From preliminary observations on the latter point I am inclined to believe that metal which has been mechanically treated, as with hard-drawn rods or rolled sheets, has its tenacity increased out of proportion to its hardness as measured by a file or cutting tool. The sclerometer shows relatively little difference, for example, between hard-drawn and annealed copper, while the scleroscope shows an exaggerated effect, at all events in some cases. As the Brinell test closely follows the tenacity, it too may be expected to show marked differences between worked and annealed samples. The result in some cases is likely to be a confusion between elasticity or tenacity on the one hand, and true or mineralogical hardness on the other. For example, a piece of hard-rolled copper may give a greater hardness number than one of mild steel. Yet a tool made of mild steel will always cut copper, and no amount of cold-rolling will make copper cut steel. Hence great care is required when hardness values for different materials are compared and further information in this direction is desirable.

The question of agreement in reference to the true hardness of a sample of steel in the normal, hardened, tempered, or annealed condition is perhaps of even greater importance. To illustrate the kind of difficulty which arises, reference may be made to some recently published results by E. Maurer, in which samples of steel with varying content of carbon were heated to ascertained temperatures, quenched, and afterwards tempered or annealed at given temperatures. The hardness of the samples was then determined. When the tempering heat was 300 degrees Cent. the loss of hardness in a sample containing 0.83 per cent of carbon was 11.1 per cent by the Shore method, and 38.0 per cent by the Brinell test. A steel with 0.95 per cent carbon tested in a similar manner by Heyn and Bauer with a Martens sclerometer gave a loss of hardness of 41.0 per cent; while lastly Boynton, with a Jaggar sclerometer, using a steel with 0.86 per cent carbon, has recorded a loss of hardness on tempering at 300 degrees of only 9.1 per cent. The question may be put in this way: The steel is suited for making wood-working tools, if properly hardened and tempered. Is 300 degrees Cent. a proper tempering heat? According to the Shore test and the Jaggar test the tool should be hard and cut well; but according to the Brinell test and the Martens sclerometer it has lost nearly half its original hardness, and should rapidly lose its cutting edge. Maurer states that every-day experience shows that with this class of steel tool a tempering heat of 300 degrees renders the metal useless for wood-working.

The results of the four sets of experiments are given in the following table:

TABLE II. — PERCENTAGE LOSS OF QUENCHING HARDNESS ON TEMPERING.

Temperature of Heating.	Brinell Method (0.83 per Cent Carbon).	Martens Sclerometer (0.95 per Cent Carbon).	Jaggar Microsclerometer (0.86 per Cent Carbon).	Shore's Method (0.83 per Cent Carbon).
160	..	2.5	1.8	3.7
200	13	14.0	5.4	2.7
300	38	41.0	9.1	11.1
400	68	70.6	23.6	33.0*
500	94	87.5	64.0	92.5
600	100	95.7	94.5	100

*At 380°.

The values are graphically represented in Fig. 1, from which it will be seen that the greatest difference occurs at about 300 degrees Cent., the loss of quenching hardness due to tempering being returned as about four times as great when tested by the two first methods as compared with the results obtained when the steel is tested by the two latter methods given in the table.

Further, Martens and Heyn have recently pointed out that in the ball

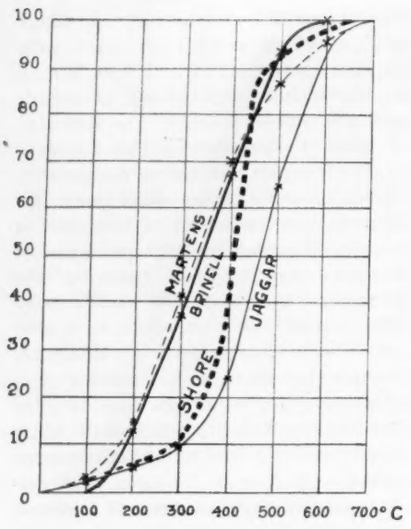


FIG. 1—PERCENTAGE LOSS OF QUENCHING HARDNESS ON REHEATING TO VARIOUS TEMPERATURES.

test for hardness the indentations are frequently not circular, and are therefore difficult to measure, and that when testing hard materials the ball itself is appreciably flattened while under load. To diminish these sources of error Martens has introduced a special form of apparatus for measuring the depth of the indentation. The results of tests with this machine on a sample of tool steel containing 0.95 per cent of carbon were as follows:

	Hardness Number.
Forged steel	277
Heated to 900° and water-quenched	2775
Heated to 900° and reheated to 100°	2775
Heated to 900° and reheated to 200°	2285
Heated to 900° and reheated to 275°	1060
Heated to 900° and reheated to 400°	595
Heated to 900° and reheated to 500°	446
Heated to 900° and reheated to 700°	277

From these figures it appears that the increased hardness due to quenching was 2775 — 277, or 2498, while this was reduced by tempering at 275 degrees to 1060 — 277, or to 783. In other words, the steel, when tempered at 275 degrees, retained only 31 per cent of the additional hardness due to quenching, the loss in this case being about twice as great as that given by Maurer when similar metal was tested by the Brinell method and by the sclerometer.

It is evident, therefore, that further research and comparison is required before agreement in principle can be arrived at with hardness tests for hardened, tempered, or mechanically treated metals. Should this paper lead to an interchange of views, and promote further inquiry, it will have accomplished a useful purpose.

AN INTERESTING BLAST FURNACE CHIMNEY.

In connection with extensive improvements which have been completed or are now under way at the Oxford furnace of the Empire Steel & Iron Co., Oxford, N. J., a radial brick chimney which incorporates some interesting features has been built by the M. W. Kellogg Co., 50 Church street, New York city. The chimney is 175 feet in height and has an internal diameter at the top of 10 feet. The brick used are corrugated on the sides to insure greater strength in the masonry bond for resisting the strains due to the high temperature of the stack. The walls are reinforced every 8 feet with steel bands built in the masonry, and the top of the chimney is entirely covered by a heavy cast iron cap.

As will be seen from the accompanying drawing, the stack is built round to the foundation, the flue openings being below the grade line. At the top the wall is 7½ inches thick; at intervals of about 16½ feet this thickness is increased by 2-inch offsets until the wall at the bottom is 26 inches. The stack is lined to a height of 90 feet above the foundation. The lining is built of 4½-inch firebrick for a height of 30 feet, and for the upper 60 feet is constructed in four sections of extra hard burned radial brick, the sections being carried on four brick corbels.

The stack is guaranteed to withstand a temperature of 1,400 degrees. Its lightning protector consists of four solid copper platinum tipped points, connected by two 7/16-inch copper cables to ground plates buried in permanent moisture.

Reports just compiled of all accidents on the 23,000 miles of track of the Pennsylvania railroad system for the past year, show that during 1908 the various lines of the system carried 141,659,543 passengers, and that not one single passenger was killed as the result of an accident to a train. During the year the lines of the system carried 11,344,413 less passengers than in 1907—a loss of 7.4 per cent, but the total number of passengers injured in train accidents numbered only 102, a reduction of 452 or 81.6 per cent from 1907.

The National Tube Co., McKeesport, Pa., has added to its 22,800-horsepower of Crocker-Wheeler motors to the extent of 275 horsepower for the operation of saws and other rolling mill machinery.

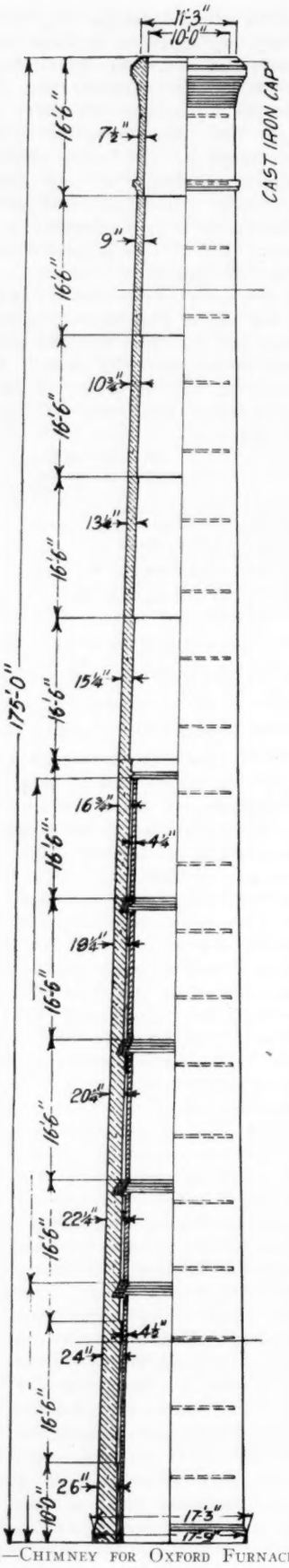


FIG. 1—CHIMNEY FOR OXFORD FURNACE, EMPIRE STEEL & IRON CO.

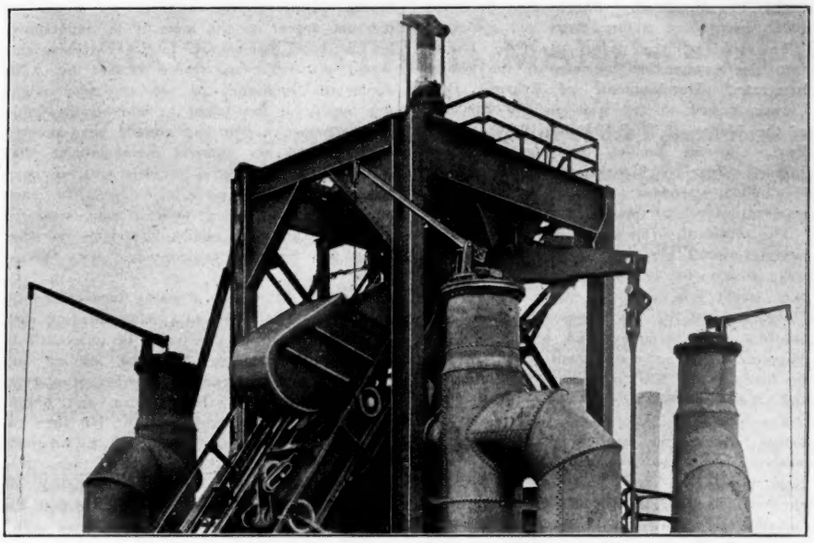


FIG. 2—VALVE INSTALLED—CLOSED.

A NEW EXPLOSION VALVE.

A. O. Baer and A. G. Witting, connected wth the Illinois Steel Co., South works, have recently devised and patented a safety explosion valve for blast furnaces, which is said to have proven a successful solution of a difficult problem.

This valve, although permitting a free escape of gas, still prevents the throwing out of any coke or ore when a furnace slips. Any one familiar with blast furnace operation knows that many serious accidents have occurred from this cause among the men working around the furnace, and besides, a considerable expense is added to the cost of producing pig iron by the loss of ore, coke and limestone, and from the labor connected with cleaning up the scattered materials.

As the accompanying illustration, Fig. 1 shows, the valve is simply a double acting combined disc and bell valve, the disc (1) forming the valve proper. The bell (2) is bolted to the disc and protrudes down into the bleeder pipe (3), and being of a smaller diameter than this, leaves an annular space (4) at the circumference, not more than a couple of inches wide, but of an area somewhat larger than the free area at the valve seat (about corresponding to an 18-inch pipe, or to any other size if the diameters are made correspondingly larger). The bell is provided with lugs (5) which, when the valve is lifted by the internal pressure, stop it before it reaches the valve seat, thus keeping the valve open. At some distance below the bell is a ring of angle iron (6). This ring prevents the material that is thrown out by a slip from passing up along the circumference of the pipe and deflects it inward. All the material will then strike the inside of the bell, which arrests its travel and repels it downward and inward. The valve can be set to open at any pressure desired.

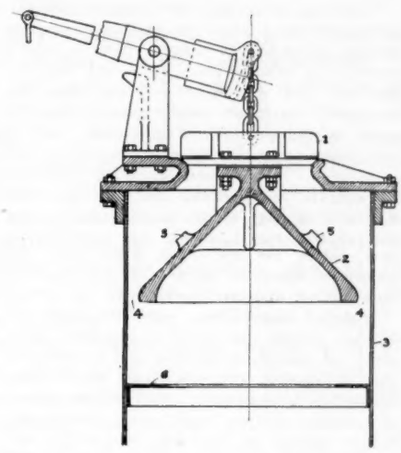


FIG. 1—SECTIONAL VIEW OF BAER-WITTING EXPLOSION VALVE.

Valves of this type have been in operation at the Illinois Steel Co.'s South works for some time past, seven furnaces at present being equipped with them, and the other furnaces will be provided with them as soon as relined. These valves are proving capable of taking care of all slips, and the throwing out of materials from furnace tops is a thing of the past on the furnaces to which they have been fitted.

Ore Analyses.—The Lake Superior Iron Ore Association has issued its annual booklet, giving complete cargo analyses of Lake Superior iron ores of the season of 1908. Copies may be obtained by addressing the secretary, U. B. Treat, Rockefeller building, Cleveland.

Machinery Club Election.—The Machinery Club of the city of New York has elected R. C. McKinney, Niles-Bement-Pond Co., president; Geo. A. Post, Standard Coupler Co., vice president; Chas. A. Schieren Jr., treasurer; and Fred Stadelman, secretary.

The new appropriation bill for the state of Pennsylvania contains an item of $250,000 for new state bridges, a reduction of $500,000.

The Juniata furnace at Newport, Pa., has been blown out.

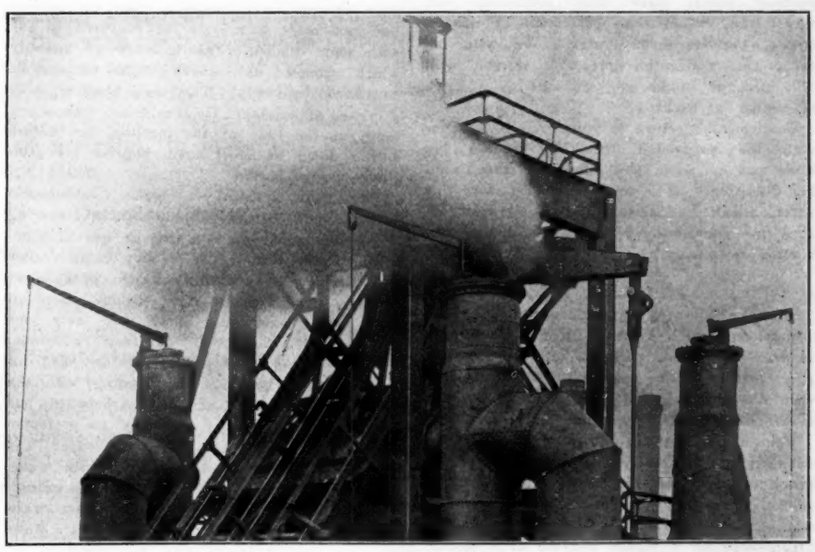


FIG. 3—VALVE INSTALLED—IN ACTION DURING A SLIP.

AN OPEN LETTER AND A MOST INTERESTING REPLY.*

The Engineer, London, publishes the following letters:

Gentlemen: You have sent me a copy of Mr. ——'s paper and asked me to take part in the discussion. My reply is, "There is nothing to discuss." You tell me that the paper is a quarter of an inch thick, would take the secretary over two hours to read, has a dozen plates, numerous diagrams in the text, and is illustrated by many samples and specimens. Your statements may be perfectly correct, but the fact remains that there is nothing in it to discuss.

Your author, I take it, has either no opinions of his own or he is so timid for his reputation that he dare not put them to the touch. He quotes well from other people, he describes at considerable length numerous interesting machines, and he records experiments of his own, or tests made for him by unchallengeable authorities. But he never, from one cover of his book—paper is misnomer for such a magnificent production—to the other cover, advances a single statement that will cause flutterings in the hearts of his audience and bring even one of them impulsively to his feet when the signal is given.

* * * * * * * * *

And for your papers, gentlemen. Let me implore you to have them written with a view to discussion. Have them short and pithy, and put descriptions, if descriptions you must have, in appendices. But let the text deal with broad facts and principles that the mind can grasp, and on which it can form rapid conclusions. Encourage your authors to risk something or find authors who are prepared to do so.

Debatable subjects are to be found. "Plenty of subjects going about," said Uncle Pumblechook in a very similar connection, "for them that know how to put salt upon their tails. That's what's wanted. A man needn't go far to find his subject if he's ready with his salt-box."

Get a fighting Irishman or two into your midst. Some one who will trail his coat and dare you to tread on it; and when you have got him nourish and encourage him. Wave red rags before the bulls of your company. The greatest political truths and the greatest political events have been hammered out, forged, and wrought to perfection by debate, strong, nervous debate, carried on with decency that convention preserves if you will, but, still, as unlike your debates as a hawk is unlike a hacksaw.

Gentlemen, I return to you Mr. ——'s paper with the suggestion that you should get some one to write you something that could be discussed; and, with apologies for this letter, which is inspired by the sincerest regard for your ancient Institution, I ask permission to remain,

A SILENT MEMBER.

Sir: The following particulars of a paper and discussions, which I heard in the latter part of last year, will, perhaps, interest some of your readers taking part in the correspondence now going on in your columns. I went to the meeting at the invitation of a friend.

You will remember, no doubt, the establishment about nine years ago of the Institution of Universal Engineers, intended mainly to consist of men in the drawing office, managers and foremen. The idea was that their desire for a higher measure of education might be stimulated. There are, I understand, now about 600 members and associates.

The title of the paper was "An Inquiry Into the Asymptotic Influence of the Kinetic Integrated Development of Erasmic Polar Curves Raised to the *n*-th on the Efficiency of the Blades of High-Pressure Turbines," by Prof. Ebenezer Emilius Saxifrage, D.Sc., of Julius college, Lomanshire. There was a very good attendance, and there were eight members of council present.

The president, after some usual routine business, expressed his regret that Prof. Saxifrage was unable to be present, but the secretary would now read the paper.

It consisted of 52 pages of close print bristling with formulas, and seven sheets of diagrams. The secretary spent about an hour in picking out bits of text which he read and then sat down.

The president said that he felt that the society was to be heartily congratulated on receiving such an extremely valuable paper from a man in so distinguished a position as Prof. Saxifrage's, and he called upon the audience to accord the author, with acclamation, a special vote of thanks. This was given with tumultuous applause. The president then said that the meeting was open for discussion.

I did not notice that there was any alacrity manifested by members in availing themselves of the president's invitation. After a pause, however, a member stood up in the body of the hall, and was about to speak when the president interfered and requested him to come to the platform. The member said it was unnecessary, as he only wanted to ask a question. After some wrangling, however, he went to the platform, and then said that he only wished to ask some one to tell him whether the discussion was likely to be over before the last train went. No one seemed to know, so he got off the platform, took his hat and went away.

Another speaker then rose and said that he felt certain that a more valuable paper could not possibly be written, and for his own part he thanked Prof. Saxifrage for it from the bottom of his heart. He felt that where all was so good it might seem hypercritical, but it seemed to him that the printer had misplaced a bracket on pages 7 and 8. At all events, there was an expression there, and he found one bracket on page seven near the top and another on page eight near the bottom. Assuming that the printer had not made a mistake he ventured to say with some diffidence that a bracketed quantity which occupied two pages might perhaps be considered unwieldy. This was, however, only a matter of opinion. He would not occupy any more of the time of the meeting, but before sitting down he must again express his gratitude to the writer.

The next speaker, a highly enthusiastic young man of large dimensions, wearing huge gold spectacles, said that he was in a position to say that if the meeting could realize the zeal with which Prof. Saxifrage had thrown himself into the turbine question they would have been more than ever cordial in the expression of their gratitude. He was proud to say that he had had an interview two or three days before with the professor. He would scarcely be believed, but it was none the less a fact that the professor had assured him that when the paper was written he—the professor—had no idea whatever of what was inside a turbine casing. He appeared to think that the blades were used to cut the steam up into chunks. Busy man as the professor was, he contrived to spend nearly ten minutes in the speaker's works examining the inside of a turbine, and asking questions, the answers to which he did not appear at the moment to understand, but he took them down in his notebook and would no doubt use them further on. No doubt the ignorance of the professor might not appear at first sight to add to the value of the paper; but it had already been pointed out by one very eminent mathematician that the man who attacked a problem with an open ignorant mind was much more likely to reach a satisfactory solution than a man saturated with that prejudice which invariably resulted from an intimate acquaintance with actual facts.

When he sat down, a young man—evidently a student—rose. He said he wanted to ask a question, and, to save time, he proceeded to walk to the platform. He took his hat and umbrella with him and a bundle of papers. At last he reached the platform and began, "Mr. President and gentlemen." He then referred to voluminous notes, which he held in his left hand. After turning them over for an interminable time and dropping his glasses, he said he was afraid he had left the note he wanted on his seat, and was going back for it when his neighbor picked it up and it was passed from hand to hand to him. He only glanced at it, and without further preface, he said: "The question I have to ask is simply what is this paper about? I have not the least idea. I see a very full meeting of the council, however, and as they have read the paper and accepted it, they can, no doubt, either collectively or individually, tell me what the *n*-th of an Erasmic polar curve is, and what use can be made of it in designing turbine blades?"

A faint attempt at applause was promptly checked. The president then said that as no one else wished to speak, he would close the discussion. He had to apologize in some measure for the paper which was to be read at their next meeting, but it had been set up for some time, and the printer wanted the type. It was by no means of the value or importance of the paper which they had just had the good fortune to hear, being indeed only a short account of experiments made on a new kind of belting, which is a compound of fine steel wire and paper. It could not pretend to possess more than a practical interest. The members would find, as usual, tea, coffee and cigarettes in the tea room.

I have had, of course, to condense my report, but I have accurately enough given the sense of what took place during a meeting which lasted from 8 o'clock to 10 p. m. Every one seemed quite satisfied.

W. STANDISH.

April 12.

*An editorial on these letters will be found elsewhere in this issue.

Urge Uniform Inspection.—A number of American and Canadian boiler manufacturers recently visited Edmonton, Alberta, to confer with the provincial boiler inspectors as to the provisions of the boiler inspection act recently enacted by that province. Subsequently a deputation waited on Hon. Robert Rogers, minister of public works for Manitoba at Winnipeg, to urge the importance of a uniform system of boiler inspection for Canada. The committee suggested the appointment of an expert by each provincial government, or the appointment of one or more representatives by the manufacturers of each province to formulate a set of rules.

COST OF STEEL MAKING IN FOUNDRIES*

Treated From the Standpoint of the Future Relation of Electric Steel Making Processes to Present Methods in Foundry Work

By Bradley Stoughton.

The object of this study is not particularly to publish the cost of making steel for castings but rather to consider this subject from the standpoint of the future relation of electric steel making processes to the present steel making methods in foundry work. The electric process has already established itself in steel works for making ingots, especially in Europe where it is now a real factor in the industry. In America there are already some electric steel making furnaces in operation and several others in the process of installation, although none of these, so far as we are informed, will enter the steel casting field. Notwithstanding that there are indications of a lively interest in this type of furnace on the part of the steel casting industry. In introducing these figures, I would say that I have no connection with electric furnaces in any way and do not expect to have, the object in making the study being merely one of interest.

Table I.

Cost of acid open-hearth steel.

Raw materials.	Price of raw materials, per 2,000 pounds.	Per 2,000 pounds of steel in ladle. Weight used, pounds.	Per cent used.	Cost.	Cost.
Pig iron	$14.00	300	15	$2.10	
Heads, gates, etc.	14.00	660	33	4.62	
Foreign scrap	14.50	1080	54	7.83	
Defective cast'gs* from bad metal	50.00*	20	1	.50	
Ferro-alloys	40.60	29	1	.59	
Total metal		2089	104	$15.64	$15.64
Operating costs				5.50§	8.85§
Cost of steel in ladle				$21.14	$24.49
Cost of steel in castings.					
Cost of steel in ladle ÷ 65 per cent** =				$32.52	$37.68
Less credit for heads, etc., as scrap =				4.62	4.62
Net cost of steel in castings.				$27.90	$33.06

**Of the steel in the ladle, 65 per cent goes into castings, 33 per cent goes into heads, gates, etc., and 2 per cent is lost in spattering, etc.

*The price given for defective castings is over and above their value as scrap.

§The charge of $5.50 for operating costs is the figure for a 25-ton furnace and large tonnage; that of $8.85 is for a small furnace and small production.

*Presented at the Cincinnati convention of the American Foundrymen's Association.

Acid Open-Hearth.

The cost of steel making by the acid open-hearth process is shown in Table I. In connection with this and the other tables it is to be observed that the price of raw materials is figured on the basis of a short ton, and all prices in this paper are based on the current price of the materials in Pittsburg, the first week of May, 1909.

It is not to be supposed that these figures will be accepted by everyone as representative of their practice or anything like it, but the prices and weights of raw materials can be changed by anyone to conform with his practice. The item of heads, gates, etc., will depend largely upon the class of work made. No doubt there are some foundries in which the percentage of heads, gates, skulls, scrap, etc., is less than 33, while in others it will be above that figure. One has only to consider the difference in this respect between a foundry making steel rolls and one doing electrical work, notably castings for motors, to appreciate how great a difference will exist. I have adopted here 33 per cent of scrap in the cases of all processes, to make this item comparative.

Defective Castings.

The item, defective castings, chargeable against the furnace, as distinguished from those chargeable against bad molding will also vary greatly in different places, and it is probably impossible to estimate an average figure either for the percentage of these made or for the price. The latter will depend partly on the average selling price of the castings, and partly on the condition of the castings when the defects were discovered, as for example, whether costs of cutting-off heads and gates, cleaning, shipping to and from the customer, etc., should be included. In point of fact it is probable that there are not many foundries in which the defective castings chargeable against bad metal are differentiated from those chargeable against bad molding, yet it is evident that the former only should be included in the cost of steel. Defective castings chargeable against molding are included in the item of heads, gates, etc.

The charge of $5.50 for operating costs per ton is practiced with a 25-ton furnace operating at maximum capacity, charging raw materials by hand. For small furnaces and furnaces operating at low capacity this item will be materially larger. It is not to be supposed that the $5.50 is a minimum figure as no doubt some practice is better than this, and $8.85 is not a maximum figure as the cost of some furnaces is somewhat higher.

Basic Open-Hearth.

The cost of making steel for castings by the basic open-hearth process is shown in Table II, and the same

Table II.

Cost of basic open-hearth steel.

Raw materials.	Price of raw materials, per 2,000 pounds.	Per 2,000 pounds of steel in ladle. Weight used, pounds.	Per cent used.	Cost.	Cost.
Pig iron	$12.75	1040	52	$6.63	
Heads, gates, etc.	14.00	660	33	4.62	
Foreign scrap	11.15	350	17½	1.95	
Defective castings*	50.00*	40	2	1.00	
Ferro-alloys	40.60	33	1½	.67	
Total metal		2123	106	$14.87	$14.87
Operating costs				6.10	9.55
Cost of steel in ladle				$20.97	$24.42
Cost of steel in castings.					
Cost of steel in ladle ÷ 65 per cent** =				$32.26	$37.57
Less credit for heads, etc., as scrap =				4.62	4.62
Net cost of steel in castings.				$27.64	$32.95

*See footnote under acid open-hearth table.

**Of the steel in the ladle, 65 per cent goes into castings, 33 per cent goes into heads, gates, etc., 2 per cent is lost in spattering in pouring.

§See footnote under acid open-hearth table.

comments made under the head of acid open-hearth steel will apply here.

The difference in costs between basic open-hearth and acid open-hearth shown here is less than the experience of several would lead them to believe. The explanation of this is that the basic open-hearth process is in use generally in districts where low phosphorus raw materials sell at a lower price as compared to high phosphorus raw materials than is the case in the Pittsburg district and also because the greater proportion of defective castings made in the basic process is not ordinarily included in figuring the cost of the steel. Furthermore, in the cost here given, the basic process is under a disadvantage through having to use 33 per cent of its own heads and gates which command a higher price in the market than scrap suitable for the basic process would demand. This condition explains the common practice of operating both a basic and acid furnace in the same plant, enabling the acid furnace to use the scrap from both processes at a favorable figure and thus allowing a larger proportion of cheaper basic scrap to be purchased outside. This condition is exemplified in Table III, where the benefit of the combination to both processes is shown.

Table III.

Cost of acid and basic open-hearth steel when together in one plant.

Raw materials.	Acid open-hearth. Per 2,000 pounds of steel in ladle. Price of raw materials per 2,000 pounds.	Weight used, pounds.	Per cent used.	Cost.	Basic open-hearth. Per 2,000 pounds of steel in ladle. Price of raw materials.	Weight used, pounds.	Per cent used.	Cost.
Pig iron	$14.00	300	15	$2.10	$12.75	1040	52	$6.63
Heads, gates, etc., from both furnaces	14.00	1320	66	9.24	.....	....	..	.....
Foreign scrap	14.50	420	21	3.05	11.15	1010	15½	5.63
Defective castings	50.00	20	1	.50	50.00	40	2	1.00
Ferro-alloys	40.60	29	1	.59	40.60	33	1½	.67
Total metal		2089	104	$15.48		2123	106	$13.93
Operating costs				5.50				6.10
Cost of steel in ladle				$20.98				$20.03
Cost of steel in castings:					Cost of steel in castings:			
Cost of steel in ladle ÷ 65 per cent				$32.28				$30.81
Less credit for heads, etc., as scrap				4.62				4.62
Net cost of steel in castings				$27.66				$26.19

Table IV.

Cost on converter steel.

Raw materials.	Per 2,000 pounds of steel in ladle. Price of raw materials, per 2,000 lbs.	Weight used, pounds.	Per cent used.	Cost.	Cost.
Pig iron	$14.00	300	15	$2.10	
Pig iron	17.40	1280	64	11.14	
Heads, gates, etc.	14.00	660	33	4.62	
Defective castings from bad metal*	80.00*	20	1†	.80†	
Ferro-alloys	40.60	35	2	.71	
Total metal		2295	115	$19.37	$19.37
Operating costs				3.50	5.50
Cost of steel in ladle				$22.87	$24.87
Cost of steel in castings.					
Cost of steel in ladle ÷ 65 per cent				$35.18	$38.26
Less credit for heads, etc., as scrap				4.62	4.62
Net cost of steel in castings.				$30.56	$33.64

*See footnote under acid open-hearth table.
†The per cent of defective castings in converter practice will actually be less than this, so that the cost is a little higher than justice to average converter practice demands. In the absence of average figures, we have charged it the same as acid open-hearth with this verbal correction.
§Operating costs, $3.50, is for one two-ton converter making 150 tons per week. The $5.50 per ton is a 2-ton converter with small production.

Table V.

Converter with large waste.

Raw materials.	Per 2,000 pounds of steel in ladle. Price of raw materials, per 2,000 pounds.	Weight used.	Per cent used.	Cost.	Cost.
Pig iron	$14.00	300	15	$2.10	
Pig iron	17.40	1360	68	11.83	
Heads, gates, etc.	14.00	660	33	4.62	
Defective castings from bad metal	80.00	40	1	.80	
Ferro-alloys	40.60	38	2	.77	
Total metal		2398	119	$20.12	$20.12
Operating costs				3.50	5.50
Cost of steel in ladle				$23.62	$25.62
Cost of steel in castings.					
Cost of steel in ladle ÷ 65 per cent				$36.34	$39.42
Less credit for heads, etc., as scrap				4.62	4.62
Net cost of steel in castings.				$31.72	$34.80

Converter.

The cost of steel-making by the converter process is shown in Table IV, where the same comments apply as those made in connection with the acid open-hearth process.

The operating cost of $3.50 per ton applies to the making of 150 tons of castings per week in one converter. It will appear too low to some practitioners who have to pay a high price for fuel, etc., and whose tonnage is lower. A second figure of $5.50 per ton is therefore shown to apply under such circumstances.

The waste of metal of only 15 per cent shown in the foregoing table, will also appear low to many whose practice is not as favorable as this and therefore Table V is given to illustrate the cost under such conditions.

Table VI.

Acid open-hearth, making small castings.

Raw materials.	Per 2,000 pounds of steel in ladle. Price of raw materials, per 2,000 pounds.	Weight used, pounds.	Per cent used.	Cost.	Cost.
Pig iron	$14.00	300	15	$2.10	
Heads, gates, etc.	14.00	660	33	4.62	
Foreign scrap	14.50	980	49	7.11	
Defective castings from bad metal	50.00	120	6	3.00	
Ferro-alloys	40.60	29	1	.59	
Total metal		2089	104	$17.42	$17.42
Operating costs				5.50	8.85§
Cost of steel in ladle				$22.92	$26.27
Cost of steel in castings.					
Cost of steel in ladle ÷ 65 per cent* =				$35.26	$40.41
Less credit for heads, etc., as scrap =				4.62	4.62
Net cost of steel in castings.				$30.64	$35.79

It will be observed that the converter is not in a position to compete on even terms with either the acid or basic open-hearth process and must rely on a special grade of work for its field. This field, as is well known, is the manufacture of steel for small castings where the small converter now holds the predominant position. Since the electric process will doubtless first enter this same field, it may be well to consider anew the acid and basic open-hearth processes from this standpoint.

Small Castings.

The most important circumstance which keeps the open-hearth processes largely out of the field of making

*Of the steel in the ladle, 65 per cent goes into castings, 33 per cent goes into heads, gates, etc., 2 per cent is lost in spattering during pouring. In making small castings the loss in pouring from a bottom-poured ladle will be much larger than this, and the cost of steel in castings would be increased $1 to $3 per ton, but data are lacking for exact estimates.

steel for small castings, and which often results in open-hearth foundries even sending their orders for small castings to foundries equipped wth a converter or crucible process, is are taken to show separately the percentage of defective castings under and over 100 pounds weight.

Wherever the electric steel-making process has come into use it has

Table VII.

Basic open-hearth making small castings.

Raw materials.	Price of raw materials, per 2,000 pounds.	Per 2,000 pounds of steel in ladle. Weight used, pounds.	Per cent used.	Cost.	Cost.	Weight used, pounds.	Per cent used.	Cost.	Cost.
Pig iron	$12.75	1040	52	$6.63		1040	52	$6.63	
Heads, gates, etc	14.00	660	33	4.62		660	33	4.62	
Foreign scrap	11.15	190	9½	1.06.		91	4½	.51	
Defective castings	50.00	200	10	5.00		300	15	7.50	
Ferro-alloys	40.60	33	1½	.67		33	1½	.67	
Total metal		2123	106	$17.98	$17.98	2124	106	$19.93	$19.93
Operating costs				6.10	9.55			6.10	9.55
Cost of steel in ladle				$24.08	$27.53			$26.03	$29.48
Cost of steel in castings:									
Cost of steel in ladle ÷ 65 per cent				$37.05	$42.35			$40.05	$45.85
Less credit for heads, etc., as scrap				4.62	4.62			4.62	4.62
Net cost of steel in castings				$32.43	$37.73			$35.43	$40.73

the large percentage of defective castings made by the open-hearth process when producing steel for small castings, say for example, castings thin in section and under 100 pounds in weight. In Tables VI and VII I have shown the costs of steel in the acid and basic open-hearth processes where the percentage of defective castings chargeable to bad metal is large. It may be that some open-hearth foundries will deny the suggestion that the percentage of defective castings due to bad metal is ever so large as the figures given but we do not think that the practice from which these figures were taken was unusually bad. If a foundry is making 1,000 tons of heavy castings per month and 50 to 100 tons of castings under 100 pounds apiece, defective castings to the extent of even 25 per cent of all the small castings would not make a great show in the month's figures unless special means

Table VIII.

Crucible steel.

Raw materials.	Price of raw materials, per 2,000 pounds.	Per 2,000 pounds of steel in ladle. Weight used, pounds.	Per cent used.	Cost.	Weight used, pounds.	Per cent used.	Cost.
Wrought iron	$25.50	1360	68	$17.34	....	....	.....
Foreign steel scrap	14.50	....	..	.....	1330	66½	$9.64
Heads, gates, etc.	14.00	660	33	4.62	660	33	4.62
Ferro-alloys	40.60	12	½	.24	12	½	.24
Defective castings	125.00	10	½	.63	10	½	.63
Total metal		2042	102	$22.83	2012	100½	$15.13
Operating costs				35.00			35.00
Cost of steel in ladle				$57.83			$50.13
Cost of steel in castings:							
Cost of steel in ladle ÷ 66 per cent*				$87.62			$75.95
Less credit for heads, etc., as scrap				4.62			4.62
Net cost of steel in castings				$83.00			$71.33

*Of the steel in the ladle 66 per cent goes into castings, 33 per cent goes into heads, gates, etc., 1 per cent is lost in pouring.

steel foundries usually employ and these figures will only be used for comparison.

Electric Steel Process.

The electric steel-making process has two advantages over the crucible process. First, it can use the cheapest form of steel scrap available in the market and second, it can turn out the highest grade of steel made, the electric furnace surpassing all others in its control over the phosphorus, the sulphur, the temperature and the gases dissolved in the metal.

The cost of making steel by the electric process is shown in Table IX, which is based upon figures furnished by the makers of some of the important furnaces and from published results of actual steel-melting operations on a commercial scale. It is evident that the chief factor in the cost is the price at which electric power is available, and therefore five different estimates are made accordingly.

Table IX.

Electric process.

Per 2,000 pounds of steel in ladle.

Raw materials.	Price of raw materials, per 2,000 pounds.	Weight used, pounds.	Per cent used.	Cost.
Steel scrap	$9.50	1330	66½	$6.32
Heads, gates, etc.	14.00	660	33	4.62
Defective castings	125.00	10	½	.63
Ferro-alloys	40.60	12	½	.24
Total metal		2012	100½	$11.81

Cost of electric power per kilowatt hour, cents.	Cost of steel in ladle.	In casting.
1	$28.81	$39.03
2	37.96	52.89
3	47.11	66.76
4	56.26	80.62
5	65.41	94.49

It is thus evident that the electric process can hardly hope to compete in cost of production with any of the prevailing processes except the crucible process, and then usually only when electric power is available at 3 cents per kilowatt hour or less. It may well be, however, that recent developments in the electric process will bring its cost down to the point where the converter process will be superseded to some extent, especially in view of the very high quality of electric steel. This question, however, is not to be taken in any sense as a prophecy. The cost of the electric process available only for large tonnages of castings is materially lower than those given above, but the cost of installation of this type of electric furnace is so large that many immediate replacements are not probable.

In conclusion, we wish to say that we have not given above the cost of any individual plant. This statement is made in justice to those with whom the writer has been connected.

A NEW DOUBLE-HEAD PIPE THREADING MACHINE.

We illustrate herewith (Fig. 1) the Murchey double-headed pipe and nipple threading machine, of which the leading feature is the automatic opening die head, the construction of which is clearly shown in Figs. 2 and 3. The die head is composed of four principal parts, namely, the body, sliding collar, adjusting shell and die holders. Across the face of the body, which is of strong cast iron, are milled heavy T slots for carrying the steel die blocks. The outside flange of this part of the head is machined at the back internally as a guide for the adjusting shell and also serves to exclude cuttings from the working parts of the die head. The hub is bored and keyseated for the steel driving shaft; the outside is fitted to carry sliding collar. The sliding collar is fitted for part of its length internally to slide upon the hub of the body, the remaining portion is threaded to receive the collar for adjusting the length of thread to be cut when machine is in operation. The exterior of the sliding collar has four lugs milled and drilled to receive the fulcrum end of the bearing levers, also a thread upon which the adjusting shell is carried and the recess to receive the shoe attached to the yoke for closing the die head. The adjusting shell which is carried upon the sliding collar at the back, and guided within the flange on the die body at the front, gives a positive, universal adjustment of the dies through the double wedge action on the bearing levers, plainly shown on Fig. 2. All the parts described are machined outside and inside to obtain perfect balance of the assembled head.

The die blocks are of machine steel, case hardened and carefully fitted to

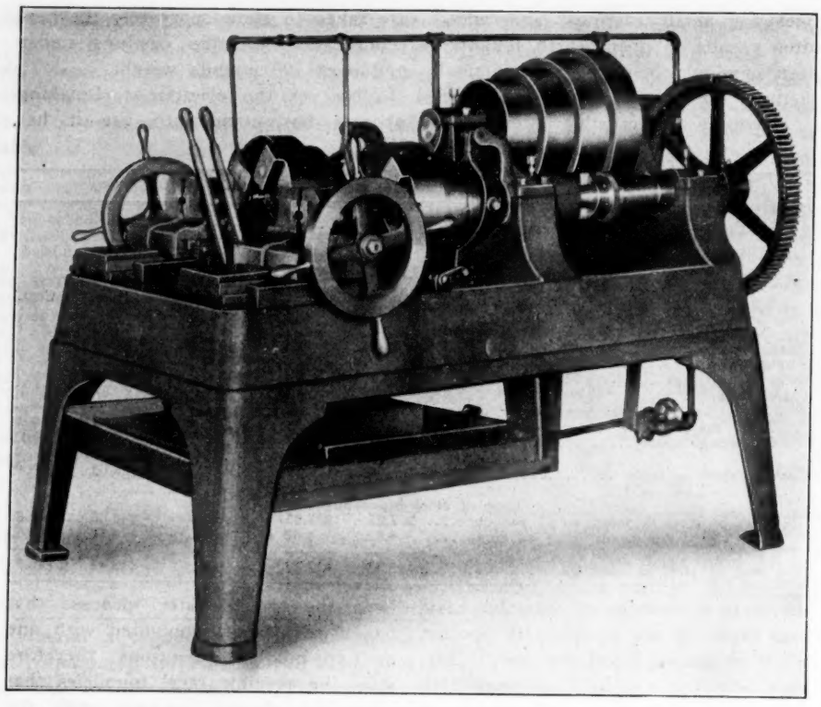


FIG. 1—THE MURCHEY DOUBLE-HEAD PIPE THREADING MACHINE.

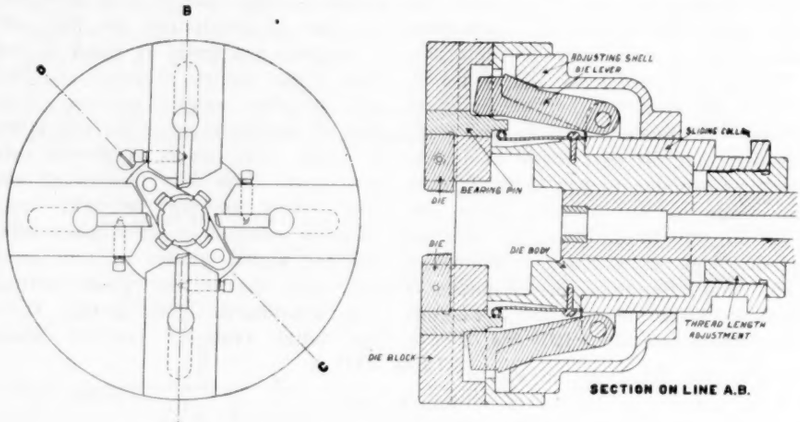


FIG. 2—FRONT ELEVATION AND SECTION OF DIE HEAD.

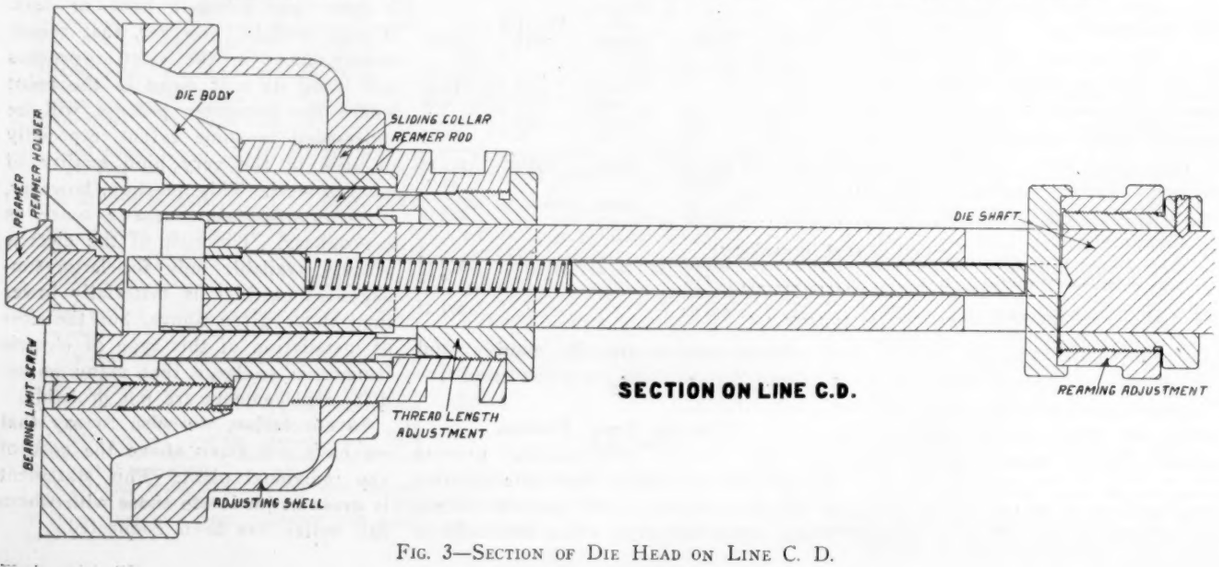


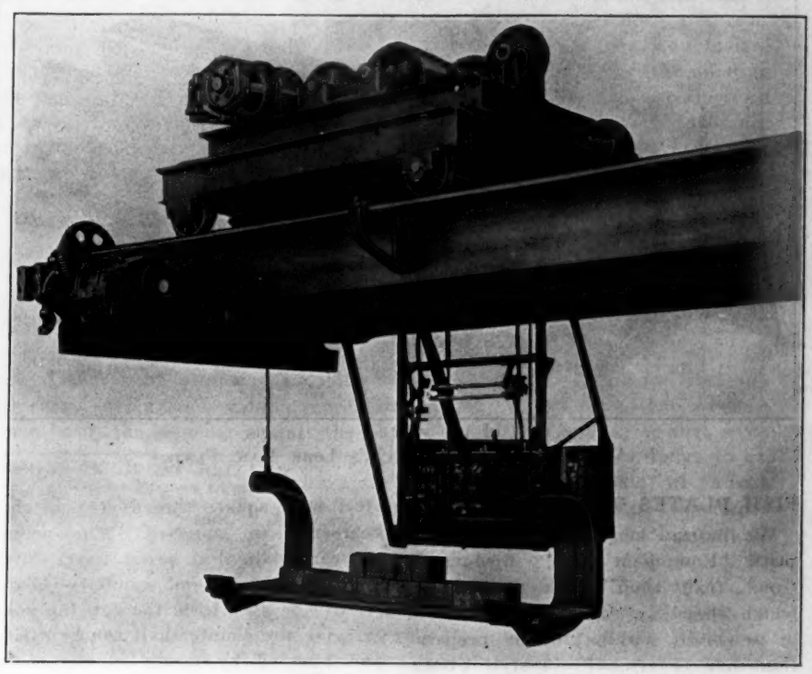
FIG. 3—SECTION OF DIE HEAD ON LINE C. D.

the slots in the die body, to prevent cutting and give extra long and durable wearing surfaces. The tempered steel bearing-pin which forms the back of the die slot, takes the thrust of the die or chaser and is also the bearing upon which the tool steel bearing lever works; is a perfect fit in the die block, has a solid backing and can be removed readily when necessary. The bearing levers are of tool steel, hung in the lugs of the sliding collar, tempered at the point of contact with the bearing-pin and turned to give bearing surface on the adjusting shell. The dies are of the best tool steel obtainable, with plain straight backs and are held firmly in position, each with one pointed set screw, entering countersink in the die, making quick and easy changes possible. The dies may be recut to original size from three to four times before discarding.

The adjustment for light or heavy internal reaming is independent and can be varied as desired and is shown in Fig. 3. Owing to the construction, the extra reaming tension that may be applied will effect the reaming only after the thread is well through the dies, so that heavy reaming will not cause a thin thread. The reamer holder is malleable iron, part of its depth being squared to receive the square on reamer shanks. The reamers are held in place by a single pointed set screw. Reamer rods attached to the reamer holder pass through long guide holes in the body of the die head and coming in contact with the adjustable collar in the back of the sliding collar push the bearing levers off the bearing pins, allowing the die blocks to be thrown open by the positive spring action when the thread length has been attained, determined by the position of the thread length adjustment collar (see Fig. 3). To prevent accident, the reamer rods are shouldered to strike the sliding collar, should the adjustable collar be too far out. When the die head is open the reamer holder with rods may be drawn out, permitting long or "running threads" to be cut.

The adjustments for this die head are few, simple and quickly made, but accomplish all that can be desired, viz., size thread, length of thread and any amount of internal reaming of the pipe end. Extreme adjustment both ways from standard size makes rehobbing dies in these die heads an easy matter.

The machine is built by the Murchey Machine & Tool Co., Detroit, Mich.



ELECTRIC TRAVELING SCALE CRANE

ELECTRIC TRAVELING SCALE CRANE.

A three-motor, electric traveling scale crane, all movements of which are accomplished by electric power, built by the Whiting Foundry Equipment Co., Harvey, Ill., is shown in the accompanying illustration. The scales are supported on a trolley truck frame and carry the hoisting mechanism on an independent, steel frame-work. The scale beams are in the cage suspended from the trolley and readings are taken and recorded by the operator. The crane is provided with three beams, two scale beams with several recording poises and one tare beam, permitting the scale weights of several different items of material to be easily and accurately determined. A movement of the hand lever transfers, when desired, the load from the knife edges of the scale to the trolley truck frame and the operation thereafter is the same as with an ordinary trolley.

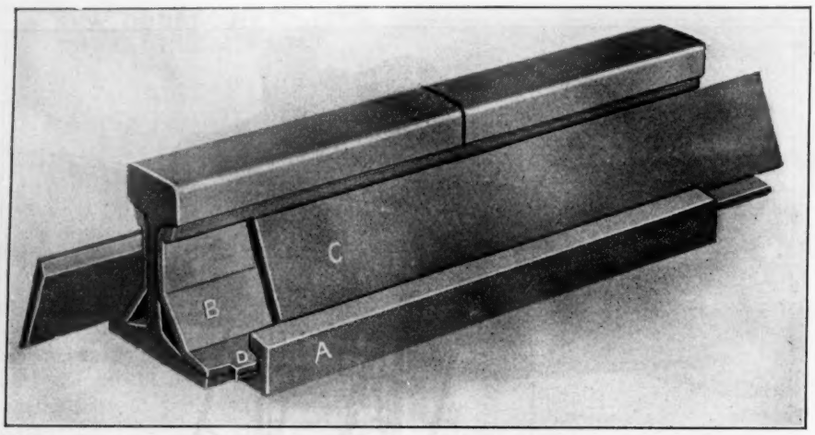
An open side platform, as shown, is furnished for carrying long pieces such as bars, rods, etc. This platform is, however, designed to suit the material to be handled. The crane is adapted for weighing material when loading, checking invoiced weights, loading for shipment, for inventory, etc. Six of these cranes of 5 tons capacity each, having a span of 37 feet 10¾ inches, have just been completed for installation in the new warehouse of the Scully Steel & Iron Co., Chicago.

Nova Scotia Steel's Plans.—In a statement to stockholders of the Nova Scotia Steel & Coal Co., President Harris has the following to say on the proposed financial plan of that company:

"The directors will ask the shareholders to authorize an issue of not more than $6,000,000 of 50-year bonds bearing interest at a rate not exceeding 5 per cent. The directors also propose to ask authority to make an issue of debenture stock ranking next after the bonds. The authorized issue of this debenture stock cannot at any time exceed the paidup capital of the company, and at present it is only intended to issue $1,000,000. This will be a 6 per cent stock, and the underwriting of this issue has been practically arranged for in London.

"We have received a very favorable proposal for our contemplated bond issue, but with the security we have to offer we hope and expect to receive more favorable terms. We hope as soon as our financial plans are carried out, as we expect they will in a very short time, to declare a dividend on the common stock, and the directors do not see any reason why this dividend cannot be maintained in the future."

The Cambria Steel Co. is operating its plant at the rate of 85 per cent. Almost 70 per cent of the plant of the Pennsylvania Steel Co. is at work.



AUTOMATIC EQUIPMENT CO.'S LOCK RAIL PLATE.

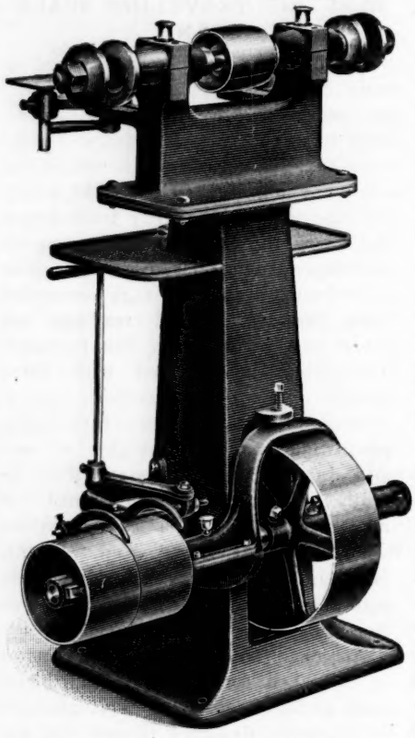
FISH PLATES WITHOUT BOLTS.

We illustrate herewith what The Automatic Equipment Co., Bridgeport, Conn., call their Lock Rail Plate, which they say can be used on old or new rails without further preparation than to remove old style plates. The object of this joint is to make the connections of rails more rigid, and at the same time permit of expansion and contraction without loosening of joints, as is now common. Where rails are connected with these plates, they are claimed to be not only locked thoroughly, but to be 0.180 per cent stronger at the joint than at any other place.

The base plate A as shown in diagram, is simply a rest and receives the end of rail, giving it a larger bearing surface on the ties. The side plate B is a fulcrum under the ball, and the thickness of this plate is diminished at the lower edge where it rests on top of the flange, so that when the key C is pushed into position, the entire joint becomes locked. Projections D on the inside of plate B fit into the regular bolt holes in the rails, and also projections at the ends of plate B when it is fixed into position, keep the entire joint from moving horizontally. The key C, after being forced into place, locks the entire joint securely. The drawing or pushing of either end of rails have no effect on the combination.

A SELF-CONTAINED GRINDER.

We illustrate herewith a double head grinder built by the St. Louis Machine Tool Co., St. Louis, in which a noteworthy feature is the self-contained countershaft. The builders call attention to the fact that the arbors are larger than usual and made of a high carbon steel with square threads two pitches coarser than standard. The arbors are carried in dust proof boxes fitted with oil cellars and capillary oilers. As will be seen from the cut, the yoke carrying the countershaft can be raised and lowered by means of the screw shown, thus providing for tightening the belt. Belting the arbor from below contributes, it is claimed, to smooth and quiet running, which is difficult to obtain with an overhead countershaft.



ST. LOUIS MACHINE TOOL CO.'S DOUBLE-WHEEL GRINDER.

The Ashland Iron & Mining Co. blew in No. 1 Ashland, Ky., stack, May 25.

BOILER EXPLOSIONS IN ENGLAND, GERMANY AND THE UNITED STATES.

The contrast between experience in the United States on the one hand, and in England and Germany on the other, in the matter of boiler explosions, is almost incredible, and it calls loudly for careful and complete investigation. So far as can be judged by a comparison of the available statistics, we are a long way behind our friends across the sea in the safe use of high-pressure steam, and we ought to send over a competent commission, to find out what the matter is, and suggest an efficient remedy.

The gravity of the situation will be apparent upon examining the tables that we present herewith. Table I, for example, is taken from an official report of the marine department of the British Board of Trade, and it gives the total number of explosions investigated by that body from 1882 down to 1907. As we understand the situation in England, all explosions in Great Britain are subject to investigation in this manner, so that the figures here given are exhaustive, and include all the explosions that have occurred during the period covered. The official year, in making out these statistics, does not correspond with the calendar year, but ends with June 30 in each case. The year designated as "1906—07," for example, began with July 1, 1906, and ended with June 30, 1907.

It will be seen that during the 25 years extending from July 1, 1882, to June 30, 1907, there were in Great Britain, 1,705 explosions, resulting in the death of 697 persons, and in injury to 1,460 others; the whole number of persons killed and injured being, therefore, 2,157.

A comparison of these figures with the corresponding ones for the United States is disheartening in the extreme. The statistics for this country, as given in *The Locomotive* for January, 1909, page 132, are summarized in agreement with the calendar years, and hence are not directly comparable with the English data as given in Table I. It appears from the data in *The Locomotive*, however, that between Jan. 1, 1883, and Dec. 31, 1906, there were no less than 7,408 boiler explosions in this country, these resulting in the death of 7,144 persons, and in injuries to 10,874 others. Thus without counting the last half of the year 1882 nor the first half of 1907, we had more than four times as many explosions as occurred in Great Britain during the period covered by the table. The number of killed, dur-

ing the same interval, was more than ten times as great here as there, and the number of injured more than seven times as great.

This vast difference in the number of explosions and of personal injuries is not to be explained by assuming that the number of boilers in this country is correspondingly greater than the number in Great Britain. We have no accurate data as to the number of boilers in the United States, and no data at all with respect to the number in Great Britain; but it is certain that there is not sufficient disparity between the two to account for the difference in the number of explosions.

TABLE I.—TOTAL NUMBER OF EXPLOSIONS IN GREAT BRITAIN.

Year.	Number of Explosions.	Personal Injuries		
		Number of Persons Killed.	Number of Persons Injured.	Total of Killed and Injured.
1882—83	45	35	33	68
1883—84	41	18	62	80
1884—85	43	40	62	102
1885—86	57	33	79	112
1886—87	37	24	44	68
1887—88	61	31	52	83
1888—89	67	33	79	112
1889—90	77	21	76	97
1890—91	72	32	61	93
1891—92	88	23	82	105
1892—93	72	20	37	57
1893—94	104	24	54	78
1894—95	114	43	85	128
1895—96	79	25	48	73
1896—97	80	27	75	102
1897—98	84	37	46	83
1898—99	68	36	67	103
1899—00	59	24	65	89
1900—01	72	33	60	93
1901—02	68	30	55	85
1902—03	69	22	67	89
1903—04	60	19	45	64
1904—05	57	14	40	54
1905—06	54	25	21	46
1906—07	77	28	65	93
Totals	1,705	697	1,460	2,157
Average of 25 years	68.2	27.9	58.4	86.3

The case is even worse than the foregoing figures indicate. It would be easy to assume that only the more serious explosions are recorded in England, and that in the statistics that are collected by the Hartford Steam Boiler Inspection & Insurance Co., a larger number of trivial accidents are included, which would suffice to account for the difference. Unfortunately the facts are just the other way. In the first place, the figures themselves, when closely examined, show that such an explanation is untenable. For example, in the British explosions the average number of persons killed, per accident, was 0.41, while the corresponding average, over the same period, in the United States, was 0.96. Judging by the loss of life, therefore, the explosions in this country were much worse, on the whole, than those in Great Britain. But we do not have to depend upon inference, to establish the fact that the average explosion in the American statistics was worse than the average one included in the British list. An examination of the regular lists that are published in *The Locomotive,* and from which our statistics are prepared, shows at once that we do not include explosions of steam pipes, except when these pipes rupture between the boiler and the first stop valve. In the British statistics, however, many steam pipe explosions are included, as will be manifest upon looking over the detailed accounts that are published by the board of trade, from time to time; and if these were omitted from consideration, so as to place the statistics in this country and in England upon a more uniform basis, the showing against the United States would be materially worse than it appears to be from Table I.

The difference in the experience of the two countries may be due in some measure to the known differences between the prevailing types of boiler that are in common use. On the other side, for example, the flue boiler is the most favored type, while in this country there are relatively few flue boilers, their places being taken by the horizontal tubular and water-tube types. This explanation does not appear to us to be adequate, however, for while we have no thought of condemning the flue boiler, we doubt very much if the mere substitution of that type for the types now in use in this country would make our steam engineering practice materially safer than it is at present.

It is impossible to give any accurate statement as to the average factor of safety in use in either country, but we have more than a suspicion that this factor is larger in England than it is here. If such is indeed the case, the fact would go a long way toward explaining the painful and humiliating comparison given above. The Hartford Steam Boiler Inspection & Insurance Co. has striven for proper factors of safety from the moment of its organization down to the present time, and it will continue to strive for them so long as it continues in business. American practice is certainly better in this respect than it used to be, and while we do not wish to approprate an unfair share of the credit for this imfair share of the credit for this improvement, we are sure that all who know our history will agree that some part of the credit justly belongs to us.

The disheartening state of affairs shown by comparing our experience with that of England is further emphasized if we compare our record, in like manner, with that of Germany. To facilitate this comparison we give, in Table 2, a summary of the boiler explosions that occurred in Germany during the 31 years beginning with 1877 and ending with 1907. For this same period our own statistics show, for the United States, 8,692 explosions, with a total of 8,768 killed and 13,151 injured. The contrast is truly appalling, and it suggests at once that the figures, as we have given them for Germany, are very incomplete. In reply to this we would say that we have made every effort to have them as complete as possible, and that they include (so far as we are aware) all of the explosions, both great and small, that were reported to the police authorities. Moreover, a very wide margin could be allowed for possible incompleteness in the German data as here presented, without affording us the least comfort; for the record, as it stands, shows approximately 17 times as many explosions in the United States as there were in Germany during the period covered by the table. Comparing the fatalities in the two countries, the case is still worse; for the number of persons killed in the United States was 27 times as great as the number killed in Germany.

The indictment against the United States in the matter of its boiler explosions is a terrible one, and there is need for radical action of some sort. A great deal could doubtless be accomplished by the adoption of larger factors of safety, and great good could be accomplished, in the opinion of the editor of *The Locomotive,* if the various companies doing a boiler insurance business would unite in adopting definite minimum factors for

all boiler parts, and definite requirements as to construction and materials, and then insist upon a rigid conformity to these requirements, before the issuance of insurance.

Of equal fundamental importance is the making of frequent and thorough inspections—not perfunctory inspections, but efficient and searching ones, such as the Hartford Steam Boiler Inspection & Insurance Co. has insisted upon, and provided for its patrons, ever since it began business. The Manchester Steam Users' Association of Manchester, Eng., which had 8,716 boilers under its care at the end of 1907, makes the proud claim that in the entire half century covered by its operations it has never lost a boiler nor a life from any cause that the association could have foreseen or forestalled. We go abroad for this illustration of the practical possibilities of good inspections, partly in order that we may not give offense by dwelling too much upon our own excellences, and partly (be it confessed) because we do not believe that any American company, no matter how good its service, can show so clear a history. Nor do we believe that any other foreign company could. We are sure that the Manchester association will forgive us if, while sincerely congratulating it upon its excellent and enviable record, we suggest that the entire spotlessness of this record is to some small extent accidental, since absolute perfection, though we ought to strive for it as hard as we can, can never otherwise be attained, over so long a period of years. Inspection, like a certain well-advertised kind of soap, can be made "99.99 per cent pure," but the other hundredth of 1 per cent is hard to realize, since inspectors are human beings, and not gods.

The 99.99 per cent inspections, although they are expensive to make, are the only ones that are really valuable. In this country one company may offer a real 99.99 per cent inspection, and another one, for a couple of dollars a year less, may offer one that looks equally good, but which is possibly only of the 50 per cent kind. The boiler owner has little to guide him in his choice, because he cannot be supposed to be minutely informed on such a specialized subject. But in England, when there is an explosion there is also a subsequent technical investigation by the board of trade; and if that body finds that there was no inspection, or that the inspection, though made, was superficial or inadequate in any way, or if it finds that the owner of the boiler received suggestions from the inspector but failed to carry them out, the fact is well advertised, and a fine is imposed upon the person or company found to be at fault. Thus in the investigations that followed the 77 English explosions reported during the year 1906-7, fines were imposed in 22 cases; the smallest of these fines being $25, and the largest $2,000. This system has certainly worked well in England, raising the standard of the inspections, and increasing the care exercised by the boiler owners and attendants; the corrective effect depending not so much upon the magnitude of the fine, as upon the publicity that is involved, and the definite fixation of the responsibility. We are of the impression that there would be a great improvement in our boiler practice, and a corresponding diminution of the number of explosions and the loss of life, if we could have, in the United States, some properly constituted power that would exercise a moral influence similar to that exerted in England by the board of trade. The boiler insurance companies that actually do give high class inspections would have nothing to lose, and everything to gain; while companies (if there be any such) which may now be making more money by giving inferior inspection service at a less cost to the assured, would either have to mend their ways, or go out of business. The services rendered by boiler attendants would also improve, on the whole, since it is but human for a man to strive to do the best that is in him, when he knows that his sins will surely find him out.—*The Locomotive.*

TABLE II.—TOTAL NUMBER OF EXPLOSIONS IN GERMANY.

Year.	Number of Explosions.	Personal Injuries			
		Instantly Killed.	Seriously Injured.	Slightly Injured.	Total of Killed and Injured.
1877	20	21	14	23	58
1878	18	7	4	9	20
1879	18	36	10	32	78
1880	20	10	5	14	29
1881	11	8	18	21	47
1882	11	19	14	15	48
1883	14	23	8	24	55
1884	14	12	11	22	45
1885	13	11	2	9	22
1886	16	10	5	8	23
1887*	14	..	..	..	..
1888	15	4	3	4	11
1889	16	6	5	17	28
1890	16	9	1	11	21
1891	10	0	3	7	10
1892	18	12	11	18	41
1893	10	6	5	10	21
1894	35	12	9	13	34
1895	23	20	23	31	74
1896	21	10	2	13	25
1897	21	17	3	19	39
1898	18	3	7	21	31
1899	14	13	11	11	35
1900	13	6	1	17	24
1901	17	10	3	14	27
1902	17	7	7	10	24
1903	10	6	0	5	11
1904	15	5	5	8	18
1905	9	4	2	3	9
1906	15	5	0	3	8
1907	16	7	4	5	16
Totals	498	319	196	417	932
Average for 31 years	16.1	10.3	6.3	13.5	30.1

*We have no full statistics for 1887. The 14 explosions recorded include 37 individual boilers. The terrible explosions at Friedenshuette, illustrated in our issue for June, 1888, and in which 22 boilers blew up simultaneously, occurred in that year. By that explosion three employees were instantly killed, nine were injured so badly that they died within a few days, and thirty others were injured more or less severely, but not fatally.

Filling Blow Holes.—The filling of cracks and holes in castings and similar work is often very important, and almost every foundry and machine shop has to do it at some time or other. The S. Obermayer Co., Cincinnati, Chicago and Pittsburg, has placed on the market what it terms the National Iron Filler Cement for this purpose. It is put up in 12-pound cans and comes in the form of a powder which has simply to be mixed with water to the consistency of a stiff putty and applied to the crack or other defect. After a few hours this cement metalizes and becomes a part of the iron itself. The defect so repaired can scarcely be noticed and this material permits of machining as it has virtually become a part of the casting.

Charles K. Thomas, formerly sales manager of the D. T. Williams Valve Co., Cincinnati, has been chosen vice president of the company to succeed Francis X. Pund, who died May 8.

FIFTH INTERNATIONAL CONGRESS FOR TESTING MATERIALS.

The fifth congress of the International Association for Testing Materials will be held at Copenhagen, Denmark, Sept. 7 to 11.

The following papers, of special interest to readers of THE IRON TRADE REVIEW will be discussed at the congress:

"Metallography," official report by Prof. E. Heyn, Gr.-Lichterfelde.

"Special Steels," by Prof. L. Guillet, Paris.

"The Heat Treatment of Spring Steel," by Lawford H. Fry, Paris.

On a Metallographical Subject: by W. Rosenhain, Teddington.

"Hardness Testing." Official report by Dr. F. Ludwik, Vienna.

"Simplified Apparatus for Ball Pressure Tests," by Prof. E. Heyn and A. Martens, Gr.-Lichterfelde.

"The Cone Pressure Test Used for the Determination of the Hardness of Iron Superstructure Material," by Dr. A. Gessner, Vienna.

On the Brinell Method of Hardness Determination, by H. Moore, London.

"Impact Tests." Official report by G. Charpy, Paris.

"The Definition of Resilience in Connection with Impact Tests," by L. Revillon, Paris.

"Impact Tests on Notched Bars at Different Temperatures," by Prof. L. Guillet and L. Revillon, Paris.

On "Impact Tensile Tests," by P. Breuil, Paris.

On "Impact Bending Tests on Notched Bars," by Prof F. Schule and E. Brunner, Zurich.

"Comparative Statical and Dynamical Notched-Bar-Tests," by Dr. A. Leon and Dr. P. Ludwik, Vienna.

"Application of Modern Testing Methods to Alloys of Copper," by L. Guillet and L. Revillon, Paris.

"The Dynamic Load and Impact Tests," by Welikoff, Moscow.

On "Piece Tests of Important Structural Parts," by O. Honigsberg, Vienna.

"Testing Metals by Alternating Stresses." Official report by J. E. Howard, Watertown.

"Quality of Time Tests of Copper Wire," by Prof. F. Schule and E. Brunner, Zurich.

"Testing of Cast Iron." Official report by Dr. R. Moldenke, New York.

On the "Testing of Cast Iron," by the Brothers Sulzer, Winterthur.

"Influence of Increased Temperature on the Mechanical Qualities of Metals." Official report by Prof. M. Rudeloff, Gr.-Lichterfelde W.

Plans are being prepared for a foundry to be built as an addition to its branch, the Stanley G. I. Co., at Pittsfield, Mass., by the General Electric Co. It is expected that the foundry will cost when completed $100,000. An addition is now being made to the foundry on the north which will nearly double its capacity. The west end of the foundry will be lengthened to 145 feet, two stories, the entire width of the building. When completed the building will have a frontage on East street of 520 feet, and will extend north approximately 300 feet. Contracts will be awarded shortly with the idea of having the building ready for occupancy in the fall.

SOME IMPROVEMENT

Noted in Machine Conditions in New England.

Worcester, Mass., June 5.—A note of improvement in business conditions is prevalent among the machinery manufacturers, which up to recently was not nearly so much in evidence as among other lines of manufacture like looms, envelopes, shoes, cloth finishing machinery, etc.

The old Green street plant of the Crompton & Knowles loom works, is being moved into the Grand and Tainter street plant. The Green street plant is the original Crompton Loom Works founded by the late George Crompton. Soon the company's entire Worcester buisness will be under one roof and one management. The old Green street buildings will then be for sale. The offices are being consolidated, in commodious quarters on the first floor of the new Tainter street addition.

The Morgan Spring Co. has work enough booked to keep it going night and day for several weeks. Martin Olin has been made foreman of the staple department to succeed Edward D. Coe. Mr. Coe was formerly superintendent of the works but was replaced several weeks ago by C. A. Vidinghoff, a Chicago man. Mr. Coe was formerly in the employ of the Parker Wire Goods Co.

THE BRITISH WARRANT SYSTEM.

The recent steady increase of stocks in Connal's stores, Middlesbrough, Eng., has once more concentrated interest on the speculative value of pig iron warrants. At present, there is about 200,000 tons of pig iron in store, but three years ago this amount reached 750,000 tons, practically all of which was sold during the last boom, and a great proportion of it to America. It is clear that the public are once more realizing the speculative value of these products. The most aggressive signs are the frequent references in market reports to the operations of the "bulls" and the "bears," and the inflation and depression of the market. The peculiar system in vogue enables transactions to be carried through in the course of the year to the extent of quite ten times the amount of iron in store.

The warrant system is probably well understood in America, but to the uninitiated it may be explained that the receptacle known as Connal's stores is simply an extensive pig iron dumping ground to which Middlesbrough makers send their surplus iron, for which there is no immediate demand. Messrs. Connals give a certificate of acknowledgment and this at once becomes a saleable document. Warrants are sold to the public on the security of the iron being in store and available, and the convenience to the smelter consists in the fact that the warrant becomes a security on which he can obtain money advances from the bank, or from other sources. A speculative public finds a certain amount of nervous excitement and suspense, wholesome or otherwise, in buying and selling these warrants, and at times a lot of money is made and lost. These little deals contribute something to agitate the otherwise somewhat serene, not to say sleepy, social atmosphere of Middlesbrough. But the principal transactions are at Glasgow.

There is now, however, a market for London, where brokers devote themselves specially to this class of business. How it works out is suggested sometimes by the market report that 2,000 to 10,000 tons of business have been done, whereas, the same report gives the amount in store as practically unchanged. During a recent week, for example, prices fell about 1 shilling per ton, for no very perceptible reason, and this points to the fact that some speculators have been rather badly hit. Years ago when prices fluctuated more extensively, the warrant market was a tempting arena for a plunge, and stories were occasionally told of £10,000 to £15,000 being made or lost in a day or two. While the risks are now less, this circumstance has made warrant speculations more tempting to the small speculator, who likes a little flutter for his money without any prospect of very serious loss or gain.

Arthur J. O'Leary & Son Co., Chicago, advises respecting plans for new buildings that the purpose of the new construction recently noted, is to replace its present buildings. They will be built of sections and will include altogether three buildings four stories and basement, 60 x 142 feet. The equipment used by the company at present will be installed in the new buildings.

NEW CHANGES

ARE PROPOSED IN THE METAL SCHEDULE.

Opposition to Some Reductions—Low Tariff Men Will Fight Some Features of the Administrative Sections.

Washington, D. C., June 7.—Immediately following the suggestion made a week ago of the probability that the metal schedule of the tariff revision bill has been substantially agreed upon, in line with the form the schedule took after the greater part of it had been passed by the senate, and this was given as evidence of the wisdom of the leaders in the metal industry in proceeding to arrange for important business developments, intimations are given that there are still to be material changes in the metal schedule before the bill is finally agreed upon by the senate and sent to conference.

It appears from the developments during the past week that a number of the leading iron and steel manufacturers, notably some among the so-called independents, are displaying considerable unrest regarding the changes in rates made by the tariff revision bill, especially those changes which make reductions in duties amounting in some instances to from 30 to 50 per cent. It is claimed that upon careful investigation of the situation and the probabilities of increased importations in some lines, the leaders in the industry have urged the finance committee to make another examination of the schedule, and if possible not only to rewrite some of the paragraphs, but to make some advances in the duties imposed even in the sections that have already been agreed to by the senate.

In accordance with this suggestion, it is claimed that pending the final action of the finance committee upon the uncompleted paragraphs of the metal schedule, the committee will be prepared to submit to the senate a number of changes in paragraphs that already have been adopted.

Important Changes Proposed.

The probability is that these changes in the metal schedule will not be submitted to the senate until after the great contests over the cotton goods and woolen goods schedules have been settled. It has developed that a number of important changes have been suggested by the leaders in the iron and steel industry, and that these changes are now under consideration by the members of the finance committee, with the prospect that some of the changes, at least, will be approved by the committee and be submitted to the senate for adoption before the bill is sent to conference.

It is asserted that the paragraphs relating to rods and strips of steel will be rewritten to correct what is now regarded as error in those paragraphs, in that loop-holes are left open which may be taken advantage of by importers of foreign metals covered by these paragraphs. It is also asserted that the rates on structural steel are to be slightly raised. It is claimed that the reductions in the rates below the Dingley law schedule by the senate revision bill are too sweeping, and that a re-examination of the subject by the finance committee will convince the committee of that fact, and will warrant the modifications in the paragraphs covering structural steel, which have been suggested by the representatives of the iron and steel industry. Representatives of this industry have been in conference with the finance committee members during the past week, and their statements to the committee have had the effect to impress the committeemen that the reductions agreed upon up to this time in the revision bill are too great. It is intimated that the rates will probably be raised approximately to five-tenths of a cent per pound.

Steel Rail Duty.

Broad intimations are also given that the rate on steel rails may be raised. This item is still open for consideration by the senate, and efforts have been made by many members of the senate, as well as the finance committee, to obtain the latest and fullest possible data regarding the actual needs with respect to duties on steel rails. It is claimed that the United States Steel Corporation has been able to demonstrate to many members of the senate that the cut of 50 per cent made in the bill as reported is too much. The present demand is that the rate shall be raised to $5 per ton.

Just the time when these features of the metal schedule are to be taken up, has not been determined. Chairman Aldrich and his associates of the finance committee are not disposed to return to the metal schedule until considerable progress has been secured in other controverted sections of the bill. This is the reason given by the finance committee for not taking up and disposing of the passed-over paragraphs covering some of the basic materials in the schedule.

Made a Strong Showing.

The contest during the past week over cotton goods has been the fiercest that has waged in the senate since the revision bill was reported. The advocates of lower duties have made a stronger showing in their attack upon the duties imposed in the revision bill upon cotton goods than upon any other feature of the bill. It is asserted that a similar contest, although perhaps not so fiercely conducted, will appear in the senate next week when the schedule covering wool and woolens is taken up.

The decision of the senate to hold night sessions has had the effect to enable the finance committee to make considerable progress upon minor details of the bill. In the schedule covering sundries, a large number of paragraphs have been agreed to without serious objection.

It has become manifest from the discussion in the senate during the past week that the administrative sections and the maximum tariff provision will be vigorously opposed by those who advocate lower duties, because of the claim that the 25 per cent additional duties provided for the maximum tariff provision will result, if utilized at any time, in absolutely prohibiting imports of foreign commodities of any kind.

ARTHUR J. DODGE.

COKE APPRAISEMENT.

Appraisement of the various independent coke properties in the Connellsville region upon which options have been given to Chas. W. McKnight, John Boileau, of Pittsburg, and associates, in connection with the proposed merger of the independent coke operations, has been started in order to set an accurate valuation upon the different operations. The appraisers are John M. Rayburn, mining engineer, Pittsburg, Jas. B. Hogg, mining engineer, Connellsville, Pa., and John W. Grantham, contractor and builder, Scottdale, Pa. It is reported that in some cases prohibitive prices have been asked by owners in their options.

The total production of lead in the United States in 1908 was 836,868 pounds as compared with 891,612 pounds in 1907.

The United States Cast Iron Pipe & Foundry Co. stockholders will hold their annual meeting on June 23.

Great Activity Shown in Stocks

Business in all exchanges was suspended Monday on account of the observance of Memorial Day. Tuesday's opening was buoyant, Steel common advancing to the highest price of the year on the report that application had been made to list Steel Corporation shares on the Paris bourse; July wheat advanced in Chicago to $1.19½; copper metal was weak and lower in London. Steel common again advanced Wednesday to 67¼, and the preferred to 122, these being the highest prices in the history of the Corporation; however, the general market was heavy and closed lower; all grades of copper metal advanced ⅛ cent in the asking prices in New York and closed lower in London. Thursday's market advanced to the highest level of the year on sales of nearly 1,500,000 shares; grain prices declined on more favorable crop reports. Friday the Steel stocks did not score the usual new high prices, and finally closed lower; American Can preferred and Republic preferred advanced to the highest prices for more than three years; dividends were again declared on Republic preferred; all grades of copper metal advanced ⅛ cent. Saturday's market was buoyant, the industrials displaying more strength than railroads.

Money during the week continued easy, call money ruling between 1½ and 2 per cent, averaging 1¾. Time money became gradually more active, and was obtainable with moderate ease. Exports of gold for the week ending Saturday were $2,120,440, of which $1,232,440 went to South America. New York banks reported a loan expansion for the week of more than $25,000,000. The actual statement of clearing house banks showed loans increased $19,287,400; deposits increased $16,674,500; surplus decreased $7,495,075; and the percentage of actual reserve 26.30, a decrease of 0.56. Nonmember banks and trust companies reported loans increased $6,527,200; net deposits increased $6,370,700, and the percentage of reserve 18.6, a decrease of 0.2. Commercial failures for the week were 208 compared with 218 the preceding week and 295 the corresponding week last year. The fortnightly bulletin of idle cars showed a decline of 11,642 cars.

Shares were sold during the week to the number of 5,336,964, compared with 2,614,640 the preceding week and 4,103,585 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $34,323,000, compared with $20,076,000 the preceding week and $14,674,000 the corresponding week last year.

THE LEADING INDUSTRIAL SECURITIES.

	Closing Quo. June 5	Changes in Week	Date Ann.	1909 M't'g.	Stock Outstanding	Dividend Basis	Dividend Last Declared	Dividend Date Last Div. Pay.
Allis-Chalmers	15¼	— ½	Sept.	2	$19,820,000		.....	.....
Allis-Chalmers, pr	52⅜	+ ⅛			16,150,000	7 cum	1¾ Q.	Feb., 1904
American Can	13¼	+ ⅜	Feb.	2	41,233,300		.....	.....
American Can, pr	84¼	+2¼			41,233,300	7 cum	1¼ Q.	Jan., 1909
Am. Car & Foundry	57½	+1	June	24	30,000,000		½ Q.	Jan., 1909
Am. Car.& Fdy., pr	117	+ ¼			30,000,000	7 n. c.	1¾ Q.	Jan., 1909
American Loc	61	+2⅞	Oct.	19	25,000,000	5	1¼ Q.	Aug., 1908
American Loc., pr	116⅞	+1⅞			25,000,000	7 cum	1¾ Q.	April, 1909
American Ship	60	.....	Oct.	13	7,600,000	4	1 Q.	June, 1908
American Ship, pr	108	+ ¼			7,900,000	7 n. c.	1¾ Q.	Oct., 1908
Am. Steel Foundries(new)	49	+7¾	Dec.	2	17,184,000		.....	.....
Am. Steel Foundries, pr	47½	.....			17,240,000	6 cum	1	Aug., 1904
Barney & Smith	30	.....	June	1	2,000,000	4	1 Q.	Sept., 1907
Barney & Smith, pr	95	.....			2,500,000	8 cum	2 Q.	June, 1908
Bethlehem Steel	32½	+3	April	6	14,862,000		.....	.....
Bethlehem Steel, pr	64	+2¾			14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	42¼	+2¼	March	16	45,000,000*	3	1½ S. A.	Feb., 1909
Cambria Iron	46	— ¼			8,468,000*	4	2 S. A.	Sept., 1908
Chicago Pneumatic Tool	24	— ½	Feb.	15	6,145,800	4	1 Q.	Oct., 1907
Colorado Fuel	44⅛	+2⅜	Oct.	18	34,235,500		3½	April, 1902
Crucible Steel	9⅜	+ ½	Oct.	20	24,578,400		.....	.....
Crucible Steel, pr	70½	+1¼			24,436,500	7 cum	1 Q.	Mar., 1909
Empire Steel	9	.....	April	27	1,254,770		.....	.....
Empire Steel, pr	56	+4			2,500,000	6 cum	1½ S. A.	Jan., 1909
Fay & Egan	90	.....	Feb.	18	1,000,000	7	1¾ Q.	Nov., 1908
Fay & Egan,pr	125	.....			1,000,000	7 cum	1½ Q.	May, 1909
General Electric	160¾	.....	May	11	65,178,800	8	2 Q.	Jan., 1909
Harbison-Walker	18	+1	Jan.	18	18,000,000		½	Oct., 1907
Harbison-Walker, pr	85	+2			9,600,000	6 cum	1½ Q.	April, 1909
International Pump	41	+ ⅛	June	8	17,762,500		1	April, 1905
International Pump, pr	87½	+ ½			11,350,000	6 cum	1½ Q.	May, 1909
Lackawanna Steel	42	—1	March	10	34,971,400		.....	.....
Lake Sup. Corp	28¾	+1½	Oct.	6	40,000,000		.....	.....
New York Air Brake	89⅝	+ ⅜	June	17	8,012,500	8	2 Q.	Oct., 1907
Niles-Bement-Pond	100	.....	Feb.	3	8,500,000	3	1½ Q.	June, 1909
Niles-Bement-Pond, pr	100	.....			2,000,000	6 cum	1½ Q.	May, 1909
Otis Elevator Co	55	.....	March	15	6,375,300		1½ S. A.	April, 1909
Otis Elevator Co., pr	97	.....			6,295,000	3 n. c.	1½ Q.	April, 1909
Penn Steel	50	.....	May	10	10,750,000		.....	.....
Penn. Steel, pr	105¼	.....			16,500,000	7 n. c.	3½ S. A.	May, 1909
Pittsburg Coal Co	12½	— ¼	March	9	28,104,600		.....	Nov., 1906
Pittsburg Coal Co., pr	48½	— ¾			27,071,800	7 c.	1¾	April, 1905
Pressed Steel Car	44⅛	+1	Feb.	17	12,500,000		3	Aug., 1904
Pressed Steel Car, pr	104¼	+ ½			12,500,000	7 n. c.	1¾ Q.	May, 1909
Pullman	189	.....	Nov.	10	100,000,000	8	2 Q.	May, 1909
Railway Stl. Spring	46½	+1⅜	March	4	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	108	+2			13,500,000	7 cum	1¾ Q.	Dec., 1908
Rep. Iron & Steel	32¾	+3	Oct.	20	27,191,000		.....	.....
Rep. Iron & Steel, pr	105	+9			20,416,900	7 cum	1¾ Q.	April, 1908
Sloss-Sheffield	85¼	+1½	March	10	10,000,000	5	1¼ Q.	June, 1909
Sloss-Sheffield, pr	117	+2			6,700,000	7 n. c.	1¾ Q.	April, 1909
U. S. Pipe & Fdy	35¼	+2	June	23	12,500,000	2	½ Q.	Dec., 1907
U. S. Pipe & Fdy, pr	83¾	+5¾			12,500,000	7 n. c.	1¾ Q.	Sept., 1908
U. S. Steel	68¾	+4	April	19	508,302,500	2 n. c.	½ Q.	June, 1909
U. S. Steel, pr	125⅞	+5⅞			360,281,100	7 cum	1¾ Q.	June, 1909
U. S. Steel, 5s	105¾	+ ¼			463,798,000	5	5 A.	.....
Va. Iron, Coal & Coke	66	+1	Sept.	21	9,073,680		.....	.....
Westinghouse Elec	85½	+1¾	June	16	27,173,200	10	2½ Q.	April, 1909
Westinghouse Air Brake	110½	+ ½	Oct.	5	14,000,000*		2½ Q.	Oct., 1907

Par value of shares, $100, except those starred (*), $50.

Copper Stocks.

New York.—Amalgamated Copper closed 87¾, a net gain of 2½.

Boston. — Butte Coalition closed 26⅞, a net gain of ⅛; Calumet & Arizona closed 104, a net gain of 1¼; Calumet & Hecla closed 670, a net gain of 15; North Butte Mining closed 56¾, a net loss of 1; Quincy Mining closed 93, a net gain of 2.

Financial Notes.

The Republic Iron & Steel Co. Friday announced the resumption of the regular quarterly dividend of 1¾ per cent on preferred stock, the first payment since April, 1908. An extra dividend of ¼ per cent was also declared in part payment of back dividends, these declared dividends being payable July 1; the Ingersoll-Rand Co. declared the regular semi-annual dividend of 3 per cent on preferred stock, payable July 1; the American Can Co. the quarterly dividend of 1¼ per cent on preferred, payable July 1; the Thompson-Starrett Co., the regular semi-annual dividend of 4 per cent on common, payable July 1; the Canadian General Electric Co., Ltd., the regular quarterly dividend of 1¾ per cent on common, payable July 1; the American Smelting & Refining Co., the regular quarterly dividend of 1¾ per cent on preferred, payable July 1, and 1 per cent on common, payable July 15.

NEWS FROM MANY INDUSTRIES

New Buyers:—

The Imperial Brass Co., Detroit, capitalized at $10,000, has been incorporated by A. Leo Kent and T. B. Moore as the principal stockholders.

The Timken-Detroit Axle Co., Canton, O., $1,000,000 capital stock, has been incorporated by William R. Timken, H. H. Timken, E. W. Lewis, H. W. Alden and A. D. Emory.

The Monarch Tool Co., Cincinnati, has been incorporated with $10,000 capital stock by Otto C. Crentz, Walter Bolner, G. H. Bolner and L. M. Hall.

M. Hawkins, Henry Horn and J. J. Neuberger have received a charter for the Stevens Point Foundry & Machine Co., Stevens Point, Wis., with $5,000 capital stock.

The Courier Car Co., Dayton, O., was incorporated by C. G. Stoddard, H. J. Edwards, John F. Campbell, H. W. Hayden and John W. Stoddard, with $200,000 capital stock.

A charter has been granted to the Monroe Brass Works, East Stroudsburg, Pa. The new company's capital is $50,000. Israel B. Gilbert, of East Stroudsburg, is its organizer.

A charter has been granted to the Northwestern Construction & Engineering Co., Milwaukee, capitalized at $2,000. Those interested are C. B. Holden, A. E. Reichardt and E. M. Daniel.

The Eisner Machinery & Mfg. Co., St. Louis, Mo., to manufacture and deal in machinery, with $10,000 capital stock, has been incorporated by Joseph Eisner, Edmund C. Beckmann and William T. Jones.

A charter has been granted to the Cleveland Vacuum Machinery Co., Cleveland, which is capitalized at $10,000. Those interested are S. W. Parsons, E. G. Guthrey, C. R. Auburn, F. H. Burnap and B. J. Guthrey.

The R. L. Morgan Co., Worcester, Mass., has been incorporated with a capital stock of $300,000 to manufacture motor trucks. Ralph L. Morgan, the inventor of the truck, is president and Henry E. Whitcombe is treasurer.

The Millard F. Wilfong Iron Works, Philadelphia, has been chartered in Pennsylvania with $50,000 capital. The incorporators include Millard F. Wilfong, Edward G. Nissley, Philadelphia, William Altman, Erie, Pa.

A certificate of incorporation has been granted to the Aluminum Casting Co., Cleveland, with $10,000 capital stock. Those interested are G. C. Ford, N. J. Webster, W. D. Turner, John H. Watson and J. C. Refroth. The capitalization is fixed at $10,000.

The Britton & Carleton Mfg. Co., Cleveland, electrical devices and metal products, with $10,000 capital stock, has been granted a charter. The incorporators are G. M. Carleton, F. W. Treadway, William H. Marlatt, T. B. Bolton and F. H. Pelton.

A charter has been granted to the Niagara Engineering Co., Manlius, N. Y. to manufacture gas engines, etc., automobiles, etc., with an authorized capital of $20,000. Those interested are George A. Fowler, M. Jae Topp and William H. Topp, all of Manlius, N. Y.

The Frederick A. Weed Hardware Co., Potsdam, N. Y., manufacturing hardware and hardware supplies, has been granted a certificate of incorporation, with a capital of $12,000. Those interested are George W. Sisson Sr., Frederick A. Weed and Mary B. Weed, all of Potsdam, N. Y.

The Ballantyne Fire Clay Co. of Pittsburg, filed articles of incororation at Dover, Del., to mine and produce fire clay and various other clay products. The incorporators are Carl C. Conkle, Nathaniel W. Ballantine, Pittsburg, and Martin E. Smith, Wilmington, Del. The capital stock is $50,000.

The Lincoln Engineering Co., Portland, Me., has been incorporated for the purpose of manufacturing, and dealing in electrical and other machinery, with $10,000 capital stock. The officers are: President, Leon V. Walker, of Portland; treasurer, Fred L. Pennell, of Portland.

The Kathodion Castings Works, Kingston, N. Y., manufacturing metals, metal goods, etc., with a capital of $150,000, has filed articles of incorporation through John H. Dawe, 266 W. 153d street; George C. Genet, 321 St. Nicholas avenue; Louis F. Genet, 507 West 158th street, all of New York City, and others.

The Hill-Hupfel Engineering Co., New York City, consulting engineer, designer and builder of steam turbines, gas engines, etc., with $200,000 capital stock, has been incorporated by Halbert P. Hill, 609 West 137th street, Otto G. Hupfel, 856 Eagle avenue; Carl E. Whitney, 390 Central Park West, all of New York City.

The Morris Gartenberg Co., Brooklyn, N. Y., has applied for a charter to manufacture metal work, roofing and cornices, tools, machinery, etc., with a capital of $1,000. Those interested are: Ray Gartenberg, 420 Sixth avenue, Brooklyn; Edward Roth, 744 East Ninth street; Adolph Roth, 301 East Seventh street, both of New York.

The General Vanadium Co. of America, Greensburg, Pa., has been chartered at Dover, Del., by Clarke McColley, Greensburg; William P. Dee, Baltimore; John Burlinson, New York City, and S. H. Wright, Washington, D. C. The company is authorized to manufacture, sell and produce vanadium and vanadiferous ores and metals. Its capital stock is placed at $50,000.

The Atlantic Drier Co., New York City, has been incorporated to manufacture, sell and lease drying machines and machinery, etc., with $35,000 capital stock. The incorporators include Herbert W. Shepard, 65 West 106th street; Henry A. Lloyd, 164 West Seventy-fourth street, and Jacob B. Baeran, 32 Broadway, all of New York City.

A charter has been granted to the Sterling Asbestos Co., New York City, manufacturer of packing for steam and other engines, heavy and shelf hardware, etc., with an authorized capital of $10,000. The incorporators include George P. Fall, 5 West 125th street; Armand de R. Meyers, 49 East Twenty-first street, both of New York City, and Herbert S. FitzGibbons, 85 Ashland place, Brooklyn, N. Y.

New Construction:—

The Girard Foundry & Stove Works, Girard, Kans., after having completed a number of improvements has resumed operating.

Cain & Son, Waupaca, Wis., are erecting a machine shop for automobile as well as general work, 40 x 60 feet.

The Pittsburg Metallic Lath Co. is having plans prepared for a plant at Tarentum, Pa., 132 x 200 feet.

The Baldt Steel Casting Co., New Castle, Del., is installing new gas holders, retorts, and the necessary machinery equipment to operate them.

The American Steel & Wire Co. has leased a five-story structure at 162 Chambers street, New York city, for a term of years, and will use it for sales rooms and storage.

Work has been started on an addition to the Ellwood City, Pa., plant of the Shelby Steel Tube Co., 100 x 200 feet.

The Decatur Furnace Co., Decatur,

Ind., has decided to enlarge its plant by adding a structure 80 x 100 feet on the west end of the foundry.

The William B. Pollock Co., Youngstown, has been awarded the contract for erecting the new blast furnace stack of the Struthers Furnace Co., at Struthers, O.

The contract for erecting the buildings of the Niles Forge & Mfg. Co.'s works at Niles, O., has been let to the Penn Bridge Co., Pittsburg, and actual construction has been begun. While manufacturing supplies, the company will make a specialty of heavy forgings.

The Illinois Iron & Bolt Co., Elgin, Ill., wagon skeins, has decided to increase the capacity of the Elgin shops by installing a larger machinery equipment. The shops are being rearranged to accommodate the new machinery and cement foundations are being built.

The Chicago Steel Tape Co. is receiving bids for the construction of a one-story factory building, 30 x 65 feet, of brick, to be erected at 6229 Cottage Grove avenue, Chicago, at an estimated cost of $3,000.

The Waukesha Motor Co., Waukesha, Wis., which was recently reorganized and its capital stock increased from $25,000 to $100,000, is planning to build a one-story plant 100 x 100 feet.

The Frost Gear & Machine Co., Jackson, Mich., has effected an exchange of properties with the John Hutchinson Mfg. Co., and will start at once fitting up the newly acquired property to operate with much greater capacity than the old.

Philip Lipschitz is building a plant at Dallas, Tex, for the manufacture of white metal, including solder, babbitt and other like metals. The capacity of the plant will be about 4,000 pounds per day.

The Buckeye Steel Casting Co., Columbus, O., has let the contracts for the construction of two brick additions to be used as core and coupler shops. It is estimated that the buildings will cost about $300,000.

The Vulcan Iron Works, Denver, Colo., has let the contract for a two-story brick building at the corner of Seventh and West Colfax streets. The building will be occupied by the offices, warehouse, blacksmith and structural steel departments.

Work is steadily progressing on the foundry addition to the plant of the Bettendorf Axle Co., Davenport, Ia., the structure having general ground dimensions of 500 feet square. This steel casting addition will be completed about the middle of September.

The Phillips & Buttorf Mfg. Co., Nashville, Tenn., is discussing plans for erecting a modern foundry in the west end of the city. While specifications have not yet been decided upon, still the management advises that the work of construction is a matter for the very near future.

The J. E. Bolles Iron & Wire Works is constructing a three-story reinforced concrete building at Fourth and Porter streets, Detroit, having outgrown its present quarters. The main building is 60 x 130 feet, with a one-story ell 54 x 60 feet; which will be used for storage and for a forging department.

The Standard Brass & Copper Tube Co., New London, Conn., whose incorporation was recently noted, advises that its new building, which will be one story, of brick and steel construction, 65 x 128 feet, with an ell in the rear 20 x 40 feet, is half way up. Orders have been placed for the machinery equipment required.

The Emerson Steam Pump Co., Alexandria, Va., has engaged Dodge & Day, Philadelphia, engineers, to prepare plans for the new building which the pump company will erect. The plans call for a one-story building, 60 x 215 feet, steel frame with brick walls. The estimated cost is $30,000. The new building will be occupied as a machine shop. At the present time no new equipment will be needed.

The Chicago Malleable Castings Co., of West Pullman, Ill., has about completed a new two-story brick office building, new cupola room with electric elevator and modern appliances for economic handling of this branch of its business. The company has enjoyed a steady run during the business depression and is now operating about 90 per cent of its capacity.

The Steel Fireproofing Co., Wheeling, W. Va., has been handed a deed by the Wheeling board of trade to one and one-half acres of land near Glennova upon which it is proposed to build a plant 150 x 150 feet, of brick. The company was recently incorporated by Frank Dickerson, Great Neck, N. Y.; Herbert E. Marks, Poughkeepsie, N. Y.; F. S. Dickerson, Pelham Manor, N. Y.; Francis H. Appleton Jr., Hyde Park, Mass., and Charles H. Blackman, Brooklyn, N. Y. Aside from making steel lath, other building material will be manufactured.

The American Steel Dredge Co., Fort Wayne, Ind., has let the contract for the steel work for the first building to the Noelke-Richards Iron Works, Indianapolis. The construction work will be pushed rapidly toward completion, and it is the company's intention to begin building dredges and steam shovels by Sept. 1, if possible.

At a meeting of the stockholders of the Dundee Brass Mfg. Co., Dundee, N. Y., it was decided to rebuild the brass foundry, which had been damaged by fire recently. The walls, which are of terra cotta blocks, were not badly damaged, and it is hoped that the rebuilding can be completed and the foundry placed in full operation within 60 days.

General Industrial:—

The Colby Iron Mining Co., a Michigan corporation, has filed articles to operate in Wisconsin.

The Fox Mfg. Co., Milwaukee, has increased its capital stock from $50,000 to $100,000.

A petition in bankruptcy has been filed by the creditors of the Downie-Wright Foundry Co., Rapid City, S. D., whose plant had been in the hands of a receiver for some weeks. The assets are estimated at $133,000 and the liabilities at $90,000.

The Manistee Iron Works, Manistee, Mich., has purchased the old schooner Scoville, which has been ashore for more than a year and will fit it up as a dry dock.

The receiver for the Columbus Lock Nut & Washer Co., Columbus, O., did not receive a bid on the property when he offered it for sale recently. The minimum bid asked was $45,000.

The Rushville Machine & Wagon Co., Rushville, Ill., has sold its interest in the machine shop to the Rushville Machine Works, in which Homer Wainman and H. A. Chadsey are interested.

The A. E. Shorthill Co., Marshalltown, Ia., advises that the report referring to its proposed removal to Waterloo, Ia., is untrue. Nothing of the kind has been seriously considered by the company.

The Somersworth Foundry Co., Salmon Falls, N. H., advises that the damage to its plant sustained by fire was confined merely to the roof, no damage being done to the main part of the building. It will therefore have no new building to do.

The Engineering & Foundry Co., Albuquerque, N. Mex., advises respecting its plant now under construction, that the main building is 50 x 60 feet, with a brass furnace annex 20 x 20 feet and core ovens 10 x 20 feet. This equipment has been added: No. 6 Newten cupola; No. 6 American blow-

er with 20-horsepower motor; 1-ton capacity elevator with a 5-horsepower motor; a 6-ton traveling crane with a 20-foot span. In addition have been installed two rattlers and an emery wheel stand. The company will begin at once the construction of a pattern shop in which it proposes to install complete modern equipment, including band saw, combination cut-off and rip saw, hand jointer and lathe. The company further advises that it took off a trial heat May 29, and is now ready for business in the line of straight castings of iron or brass.

The Morgan Engineering Co., 165 Broadway, New York city, has closed a contract with the Vermont Marble Co. for one 50-ton gantry crane, total span 160 feet; main span of crane 60 feet, with two 50-foot cantilevers. The crane will be used for storing marble blocks.

The Warren Iron & Steel Co., Warren, O., successor to the Penn Steel Shovel Co., began operating its rolling mill single turn June 7. The officers are: President, D. L. Helman; secretary, Lucius Jones; treasurer, C. B. Loveless; and general superintendent, M. H. Joy.

The Bucyrus Steel Casting Co., Bucyrus, O., recently poured what its officers believe to be the largest steel casting ever poured by a single ladle full of metal. When taken from the sand it was found flawless. The casting was a 25-ton bedplate for a 48-inch stroke high duty pumping engine. The bedplate was 23 feet, 10 inches over all, 72 inches wide and 64 inches high. The casting was of basic open-hearth steel and the sides of it were but 1¼ inches thick. The ladle contained 53,000 pounds of metal which required seven and one-half minutes to pour.

The new addition to the plant of the Bessemer Soil Pipe Co., Bessemer, Ala., has been placed in operation. Fourteen new floors have been added, costing $50,000, and furnishing work for between 50 and 60 additional molders and pipe rammers.

An amendment to the charter of the Chattanooga Iron & Wire Works, Chattanooga, Tenn., has been filed, increasing the capital stock from $10,000 to $25,000. R. C. Lieb, who has been sales manager of the Chattanooga Roofing & Foundry Co., has been chosen president of the iron and wire company. The other officers of the company are: Vice president, Bruce Guthrie; secretary, J. D. Wilkins, who together with W. E. Mills and B. D. Haskins, constitute the board of directors.

The Wiener Machinery Co., 50 Church street, New York City, of which Felix F. Wiener is president, advises that the company is organized principally for the purpose of selling the S. & N. beam shear. These shears are built on motor power, stationary or portable frames, of steel plates, planed inside with steel gearing, all teeth cut. Various types of the shear are built—to shear, for instance, standard beams from 7 inches up to 20 inches, 80 pounds; channels up to 15 inches; angles up to 6 x ¾ inches, etc.

One of the first steps toward the development of the Pigeon Mountain, Ga., iron ore properties recently purchased by R. C. Peters, Manistee, Mich., has been taken in the organization of the Rome & Northern Railroad Co., at Rome, Ga. The incorporators of the company are R. C. Peters, James R. Peters, Roy A. Nickerson, Richard H. Hoffman, of Manistee, and several Rome capitalists. The road is to run from Rome, a total length of 80 miles, through the counties of Floyd, Chattooga, Whitfield, Walker and Catoosa. Construction work, it is announced, will begin at once, since orders for steel rails and rolling stock have been placed.

The Georgia Locomotive Co., of Atlanta, Ga., has taken over the plant of the Albany Foundry & Machine Works, Albany, Ga., and will operate the Albany plant as a branch to be used exclusively for remodeling and repairing locomotives. The Albany works were formerly owned by the Bacon Equipment Co., which leased it to the Albany Co., composed of J. M. Farley Sr., J. J. Anderson, J. M. Farley Jr. The Georgia company, in the new deal, acquired absolute ownership of the plant. The officers of the Georgia Locomotive Co. are: President, John D. Reynolds, of New York; vice president, W. H. Hudson, of Atlanta; general manager, Horace Green, of Atlanta. Messrs. Farley dissolved their connection with the plant, but J. J. Anderson will remain as superintendent of the Atlanta works.

The Chicago Steel Car Co., Chicago, advises respecting the recently noted increase of capital stock that it was for the purpose of enlarging the business of the company, and also to complete the purchase of the plant and business of the E. A. Bryan Co., at Harvey, Ill. The Chicago Steel Car Co. has taken over this plant, and is now making improvements which will give it increased facilities for building cars and other lines which it handles. The improvements under way at present include the installation of a large amount of railway trackage, and the installation of a new sewer system, covering its entire property and some smaller additions and machinery. It contemplates the erection of new buildings in the near future, but its plans have not yet developed sufficiently for publication at this time.

Fires:—

The brick storage building of the American Iron & Metal Co., Kalamazoo, Mich., was seriously damaged, May 25, the loss being placed at $4,000. The entire plant had been damaged by fire a few weeks previously.

The foundry of the Crookston Iron Works, Crookston, Minn., was damaged, May 22, the loss being estimated at $300.

George Hayden's brass foundry at 246 Sixth street, Cambridge, Mass., a wooden structure, was seriously damaged May 21. The loss is estimated at $2,500, a number of patterns being destroyed.

TRADE PUBLICATIONS.

THE PROPER CARE OF BELTS—This is a new booklet of 24 pages, recently gotten up by the Joseph Dixon Crucible Co., Jersey City, N. J. It is divided into three sections, headed respectively:—Belts, Belt Dressings, and Hints, Kinks, Tables. The first section deals with the running condition of belts; the second takes up treatment with various preparations; and the third, as the title indicates, has general points upon belting and its use.

ENGINE ROOM GAGE BOARDS—The American Steam Gauge & Valve Mfg. Co., Boston, has issued a 12-page bulletin describing various designs of engine room gage boards, in marble and slate, and arranged for various combinations of instruments.

WOOD SPLIT PULLEYS—The Dodge Mfg. Co., Mishawaka, Ind., have sent us a 16-page, 6 x 9 booklet, entitled "From Log to Lineshaft," describing the method of manufacture of wood split pulleys, from the sawing of the log to the finished pulley, and pointing out the uses and advantages of the wood pulley.

OIL MELTING FURNACES—The W. S. Rockwell Co., 50 Church street, New York, in bulletin 74 sets forth the advantages and capabilities of the oil furnace for crucible melting, and very fully illustrates its construction and method of operation.

FOUNDRY EQUIPMENT—We have received from the Whiting Foundry Equipment Co., Harvey, Ill., a 32-page, 6 x 9-inch booklet entitled "A Model Foundry," in which the company sets forth complete designs and equipment for a gray iron foundry of 30 tons daily capacity, and for a steel and gray iron foundry of 120 tons daily capacity, with interior views, plans and illustrations, showing the various items of equipment as recommended and built by them.

TURBINES AND GENERATORS—The Ball & Wood Co., Elizabethport, N. J., has issued a 24-page, 6 x 9-inch catalog of the Rateau-Smoot turbines and generators. The turbine is of the low pressure type and is designed for utilizing exhaust steam from other sources in connection with high vacuum condensers. Details of construction are freely supplied, and views of typical installations.

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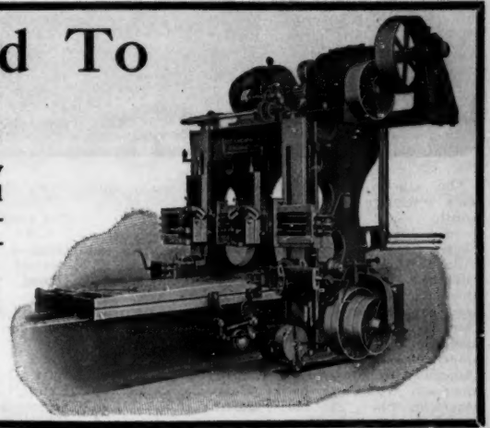

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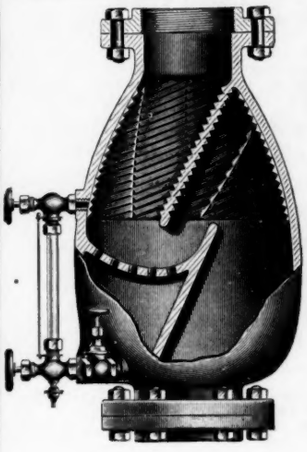

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These hoists will raise a load of two tons to a height of one foot with a pull of 125 lb. while overhauling only 39¼ feet of hand chain.
As you would have to overhaul at least 90 feet of hand chain to do the same work on the best Screw Hoists, it is plain that the CYCLONE is more than twice as fast. It can be geared to a higher speed than any other hoist with no greater hand wheel pull.
There is the least possible friction loss, the efficiency averaging nearly 80 per cent.
When there is no load the hand wheel may be spun in either direction.
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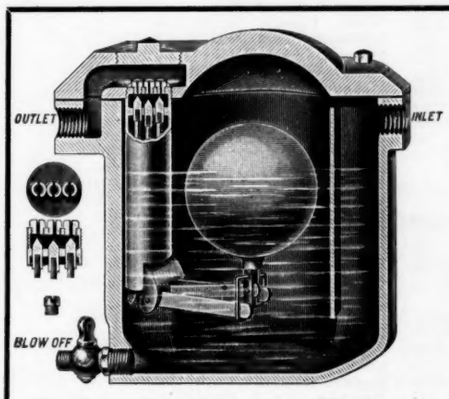

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